

69°, 291° L.H.A.

LATITUDE SAME NAME AS DECLINATION

{ L.H.A. greater than 180°Zn=Z
N. Lat. { L.H.A. less than 180°Zn=360°-Z }

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			Dec.
	Hc	d	Z																						
0	14 40.7	+43.8	105.2	14 24.9	+44.5	105.4	14 08.8	+45.2	105.7	13 52.5	+45.8	105.9	13 35.9	+46.5	106.2	13 19.1	+47.2	106.4	13 02.0	+47.9	106.6	12 44.8	+48.4	106.8	0
1	15 24.5	+43.7	104.5	15 09.4	+44.4	104.7	14 54.0	+45.1	105.0	14 38.3	+45.8	105.3	14 22.4	+46.5	105.5	14 06.3	+47.0	105.8	13 49.9	+47.7	106.0	13 33.2	+48.4	106.2	1
2	16 08.2	+43.5	103.8	15 53.8	+44.2	104.0	15 39.1	+44.9	104.3	15 24.1	+45.6	104.6	15 08.9	+46.3	104.9	14 53.3	+47.0	105.1	14 37.6	+47.6	105.4	14 21.6	+48.2	105.6	2
3	16 51.7	+43.4	103.0	16 38.0	+44.1	103.3	16 24.0	+44.8	103.6	16 09.7	+45.5	103.9	15 55.2	+46.2	104.2	15 40.3	+46.9	104.5	15 25.2	+47.5	104.7	15 09.8	+48.2	105.0	3
4	17 35.1	+43.2	102.3	17 22.1	+44.0	102.6	17 08.8	+44.7	102.9	16 55.2	+45.4	103.2	16 27.2	+46.7	103.8	16 12.7	+47.4	104.1	15 58.0	+48.0	104.4	15 58.0	+48.0	104.4	4
5	18 18.3	+43.0	101.6	18 06.1	+43.7	101.9	17 53.5	+44.5	102.2	17 40.6	+45.3	102.5	17 27.4	+46.0	102.9	17 13.9	+46.6	103.2	17 00.1	+47.3	103.5	16 46.0	+47.9	103.8	5
6	19 01.3	+42.9	100.9	18 49.8	+43.7	101.2	18 38.0	+44.4	101.5	18 25.9	+45.0	101.9	18 13.4	+45.7	102.2	18 00.5	+46.5	102.5	17 47.4	+47.1	102.8	17 33.9	+47.8	103.1	6
7	19 44.2	+42.6	100.1	19 33.5	+43.4	100.5	19 22.4	+44.2	100.8	19 10.9	+45.0	101.2	18 59.1	+45.7	101.5	18 47.0	+46.4	101.8	18 34.5	+47.1	102.2	18 21.7	+47.7	102.5	7
8	20 26.8	+42.5	99.4	20 16.9	+43.2	99.7	20 06.6	+44.0	100.1	19 55.9	+44.7	100.5	19 44.8	+45.5	100.8	19 33.4	+46.1	101.2	19 21.6	+46.8	101.5	19 09.4	+47.6	101.8	8
9	21 09.3	+42.3	98.6	21 00.1	+43.1	99.0	20 50.6	+43.8	99.4	20 40.6	+44.6	99.7	20 30.3	+45.3	100.1	20 19.5	+46.1	100.5	20 08.4	+46.8	100.8	19 57.0	+47.4	101.2	9
10	21 51.6	+42.1	97.9	21 43.2	+42.9	98.2	21 34.4	+43.6	98.6	21 25.2	+44.4	99.0	21 15.6	+45.1	99.4	21 05.6	+45.8	99.8	20 55.2	+46.5	100.2	20 44.4	+47.2	100.5	10
11	22 33.7	+41.8	97.1	22 26.1	+42.6	97.5	22 18.0	+43.5	97.9	22 09.6	+44.2	98.3	22 00.7	+45.0	98.7	21 51.4	+45.7	99.1	21 41.7	+46.4	99.5	21 31.6	+47.1	99.9	11
12	23 15.5	+41.6	96.3	23 08.7	+42.4	96.7	23 01.5	+43.2	97.2	22 53.8	+44.0	97.6	22 45.7	+44.7	98.0	22 37.1	+45.3	98.4	22 28.1	+46.2	98.8	22 18.7	+46.9	99.2	12
13	23 57.1	+41.4	95.5	23 51.1	+42.2	96.0	23 44.7	+43.0	96.4	23 37.8	+43.7	96.8	23 30.4	+44.6	97.3	23 22.6	+45.3	97.7	23 14.3	+46.1	98.1	23 05.6	+46.8	98.5	13
14	24 38.5	+41.1	94.7	24 33.3	+42.0	95.2	24 27.7	+42.7	95.6	24 21.5	+43.6	96.1	24 15.0	+44.3	96.5	24 07.9	+45.1	97.0	24 00.4	+45.8	97.4	23 52.4	+46.6	97.9	14
15	25 19.6	+40.9	93.9	25 15.3	+41.7	94.4	25 10.4	+42.5	94.9	25 05.1	+43.3	95.3	24 59.3	+44.1	95.8	24 53.0	+44.9	96.3	24 46.2	+45.7	96.7	24 39.0	+46.4	97.2	15
16	26 00.5	+40.5	93.1	25 57.0	+41.4	93.6	25 52.9	+42.3	94.1	25 48.4	+43.1	94.6	25 34.3	+43.9	95.0	25 37.9	+44.7	95.5	25 31.9	+45.4	96.0	25 25.4	+46.1	96.5	16
17	26 41.0	+40.3	92.3	26 38.4	+41.2	92.8	26 35.2	+42.0	93.3	26 31.5	+42.8	93.8	26 27.3	+43.6	94.3	26 22.6	+44.2	94.8	26 17.3	+45.2	95.3	26 11.5	+46.0	95.8	17
18	27 21.3	+40.0	91.5	27 19.5	+40.9	92.0	27 17.2	+41.7	92.5	27 14.3	+42.6	93.0	27 10.9	+43.4	93.5	27 07.0	+44.2	94.0	27 02.5	+45.0	94.5	26 57.5	+45.8	95.0	18
19	28 01.3	+39.7	90.6	28 00.4	+40.6	91.1	27 58.9	+41.5	91.7	27 56.9	+42.3	92.2	27 54.3	+43.1	92.7	27 51.2	+43.9	93.3	27 47.5	+44.7	93.8	27 43.3	+45.5	94.3	19
20	28 41.0	+39.3	89.8	28 41.0	+40.2	90.3	28 40.4	+41.1	90.9	28 39.2	+42.0	91.4	28 37.4	+42.9	91.9	28 35.1	+43.7	92.5	28 32.2	+44.5	93.0	28 28.8	+45.2	93.6	20
21	29 20.3	+39.1	88.9	29 21.2	+39.9	89.5	29 21.5	+40.8	90.0	29 21.2	+41.7	90.6	29 20.3	+42.5	91.1	29 18.8	+43.4	91.7	29 16.7	+44.2	92.3	29 14.0	+45.1	92.8	21
22	29 59.4	+38.6	88.0	30 01.1	+39.6	88.6	30 02.3	+40.5	89.2	30 02.9	+41.3	89.8	30 02.8	+42.3	90.3	30 02.2	+43.1	90.9	30 00.9	+43.9	91.5	29 59.1	+44.7	92.1	22
23	30 38.0	+38.3	87.1	30 40.7	+39.2	87.7	30 42.8	+40.1	88.3	30 44.2	+41.1	88.9	30 45.1	+41.9	89.5	30 45.3	+42.8	90.1	30 44.8	+43.7	90.7	30 43.8	+44.5	91.3	23
24	31 16.3	+37.9	86.2	31 19.9	+38.9	86.8	31 22.9	+39.8	87.5	31 25.3	+40.7	88.1	31 27.0	+41.6	88.7	31 28.1	+42.4	89.3	31 28.5	+43.3	89.9	31 28.3	+44.2	90.5	24
25	31 54.2	+37.6	85.3	31 58.8	+38.5	85.9	32 02.7	+39.4	86.6	32 06.0	+40.3	87.2	32 08.6	+41.2	87.8	32 10.5	+42.2	88.5	32 11.8	+43.0	89.1	32 12.5	+43.8	89.7	25
26	32 31.8	+37.1	84.4	32 37.3	+38.1	85.0	32 42.1	+39.1	85.7	32 46.3	+40.0	86.3	32 49.8	+40.9	87.0	32 52.7	+41.8	87.6	32 54.8	+42.7	88.3	32 56.3	+43.6	88.9	26
27	33 08.9	+36.7	83.5	33 15.4	+37.6	84.1	33 21.2	+38.6	84.8	33 26.3	+39.6	85.4	33 30.7	+40.6	86.1	33 34.5	+41.4	86.8	33 37.5	+42.4	87.4	33 39.9	+43.2	88.1	27
28	33 45.6	+36.2	82.5	33 53.0	+37.3	83.2	33 59.8	+38.2	83.9	34 05.9	+39.2	84.5	34 11.3	+40.1	85.1	34 15.9	+41.1	85.9	34 19.9	+42.0	86.6	34 23.1	+42.9	87.2	28
29	34 21.8	+35.8	81.6	34 30.3	+36.8	82.2	34 38.0	+37.8	82.9	34 45.1	+38.7	83.6	34 51.4	+39.7	84.3	34 57.0	+40.7	85.0	35 01.9	+41.6	85.7	35 06.0	+42.5	86.4	29
30	34 57.6	+35.3	80.6	35 07.1	+36.3	81.3	35 15.8	+37.4	82.0	35 23.8	+38.4	82.7	35 31.1	+39.3	83.4	35 37.7	+40.2	84.1	35 43.5	+41.2	84.8	35 48.5	+42.2	85.5	30
31	35 32.9	+34.9	79.6	35 43.4	+35.9	80.3	35 53.2	+36.8	81.0	36 02.2	+37.8	81.7	36 10.4	+38.9	82.5	36 17.9	+39.9	83.2	36 24.7	+40.8	83.9	36 30.7	+41.7	84.6	31
32	36 07.8	+34.3	78.6	36 19.3	+35.3	79.3	36 30.0	+36.4	80.0	36 40.4	+37.4	80.8	36 49.3	+38.4	81.5	36 57.8	+39.3	82.2	37 02.6	+40.3	83.0	37 12.4	+41.3	83.7	32
33	36 46.2	+34.8	77.6	36 54.6	+34.8	78.3	37 06.4	+35.9	79.0	37 17.4	+36.9	79.8	37 27.7	+37.9	80.5	37 37.1	+39.0	81.3	37 45.7	+39.9	82.1	37 53.7	+40.9	82.8	33
34	37 15.9	+32.7	75.5	37 17.6	+33.8	76.2	38 17.6	+34.8	77.0	38 30.7	+35.9	77.8	38 43.0	+36.9	78.6	38 54.5	+38.0	79.3	39 05.2	+39.0	80.1	39 15.1	+39.9	81.0	35
35	37 49.1	+32.7	75.5	38 03.7	+33.8	76.2	38 17.6	+34.8	77.0	38 30.7	+35.9	77.8	38 43.0	+36.9	78.6	38 54.5	+38.0	79.3	39 05.2	+39.0	80.1	39 15.1	+39.9	81.0	35
36	38 21.8	+32.0	74.4	38 37.5	+33.1	75.2	39 52.4	+34.3	76.0	39 66.6	+35.3	76.7	39 19.9	+36.4	77.5	39 32.5	+37.4	78.3	39 44.2	+38.4	79.2	39 55.0	+39.5	80.0	36
37	38 53.8	+31.5	73.3	39 10.6	+32.6	74.1	39 26.7	+33.6																	

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 69° , 291°

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			Dec.
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z													
0	14 40.7	-43.9	105.2	14 24.9	-44.6	105.4	14 08.8	-45.3	105.7	13 52.5	-46.0	105.9	13 35.9	-46.6	106.2	13 19.1	-47.3	106.4	13 02.0	-47.9	106.6	12 44.8	-48.5	106.8	0
1	13 56.8	-44.0	105.9	13 40.3	-44.8	106.1	13 23.5	-45.4	106.4	13 06.5	-46.1	106.6	12 49.3	-46.8	106.8	12 31.8	-47.4	107.0	12 14.1	-48.0	107.2	11 56.3	-48.6	107.4	1
2	13 12.8	-44.2	106.6	12 55.5	-44.8	106.8	12 38.1	-45.0	107.0	12 20.4	-46.2	107.2	12 02.5	-46.8	107.4	11 44.4	-47.4	107.6	11 26.1	-48.0	107.8	11 07.7	-48.7	108.0	3
3	12 28.6	-44.2	107.3	12 10.7	-44.9	107.5	11 52.6	-45.6	107.7	11 34.2	-46.2	107.9	11 15.7	-46.9	108.1	10 57.0	-47.5	108.3	10 38.1	-48.2	108.5	10 19.0	-48.7	108.6	3
4	11 44.4	-44.4	108.0	11 25.8	-45.1	108.2	11 07.0	-45.7	108.4	10 48.0	-46.4	108.5	10 28.8	-47.0	108.7	10 09.5	-47.5	108.9	9 49.9	-48.1	109.1	9 30.3	-48.8	109.2	4
5	11 00.0	-44.4	108.7	10 40.7	-45.1	108.8	10 21.3	-45.8	109.0	10 01.6	-46.4	109.2	9 41.8	-47.0	109.4	9 21.9	-47.7	109.5	9 01.8	-48.3	109.7	8 41.5	-48.9	109.8	5
6	10 15.6	-44.6	109.3	9 55.6	-45.2	109.5	9 35.5	-45.9	109.7	9 15.2	-46.5	109.8	8 54.8	-47.1	110.0	8 34.2	-47.7	110.1	8 13.5	-48.3	110.3	7 52.6	-48.8	110.4	6
7	9 31.0	-44.6	110.0	9 10.4	-45.3	110.2	8 49.6	-45.9	110.3	8 28.7	-46.5	110.5	8 07.7	-47.2	110.6	7 46.5	-47.8	110.7	7 25.2	-48.4	110.9	7 03.8	-49.0	111.0	7
8	8 46.4	-44.7	110.7	8 25.1	-45.3	110.8	8 03.7	-46.1	110.9	7 42.2	-46.6	111.1	7 20.5	-47.2	111.2	6 58.7	-47.8	111.3	6 36.8	-48.4	111.5	6 14.8	-48.9	111.6	8
9	8 01.7	-44.7	111.4	7 39.8	-45.4	111.5	7 17.7	-46.0	111.6	6 55.6	-46.7	111.7	6 33.3	-47.3	111.9	6 10.9	-47.9	112.0	5 48.4	-48.4	112.1	5 25.9	-49.1	112.1	9
10	7 17.0	-44.8	112.0	6 54.4	-45.5	112.2	6 31.7	-46.1	112.3	6 08.9	-46.7	112.4	5 46.0	-47.3	112.5	5 23.0	-48.0	112.6	5 0.0	-48.5	112.6	4 36.8	-49.0	112.7	10
11	6 32.2	-44.9	112.7	6 08.9	-45.5	112.8	5 45.6	-46.1	112.9	5 22.2	-46.7	113.0	4 58.7	-47.3	113.1	4 35.2	-48.0	113.2	4 11.5	-48.5	113.2	3 47.8	-49.0	113.3	11
12	5 47.3	-44.9	113.4	5 23.4	-45.5	113.5	4 59.5	-46.2	113.6	3 48.7	-46.8	113.6	4 11.4	-47.4	113.7	3 47.2	-47.9	113.8	3 23.0	-48.5	113.8	2 58.8	-49.1	113.9	12
13	5 02.4	-45.0	114.1	4 37.9	-45.6	114.1	4 13.3	-46.2	114.2	3 48.7	-46.8	114.3	3 24.0	-47.4	114.3	2 59.3	-48.0	114.4	2 34.5	-48.5	114.4	2 09.7	-49.1	114.5	13
14	4 17.4	-45.0	114.7	3 52.3	-45.6	114.8	3 27.1	-46.2	114.8	3 01.9	-46.8	114.9	2 36.6	-47.4	114.9	2 11.3	-48.0	115.0	1 46.0	-48.6	115.0	1 20.6	-49.1	115.0	14
15	3 32.4	-45.0	115.4	3 06.7	-45.6	115.4	2 40.9	-46.2	115.5	2 15.1	-46.9	115.5	1 49.2	-47.4	115.5	1 23.3	-48.0	115.6	0 57.4	-48.5	115.6	0 31.5	-49.1	115.6	15
16	2 47.4	-45.0	116.1	2 21.1	-45.7	116.1	1 54.7	-46.3	116.1	1 28.2	-46.8	116.1	1 01.8	-47.4	116.2	0 35.3	-48.0	116.2	0 08.9	-48.6	116.2	0 17.6	+4.9	63.8	16
17	2 02.4	-45.1	116.7	1 35.4	-45.7	116.7	1 08.4	-46.2	116.8	0 41.4	-46.9	116.8	0 14.4	-47.5	116.8	0 12.7	+4.9	63.2	1 06.7	+4.9	63.2	1 20.4	+4.9	63.2	17
18	1 17.3	-45.0	117.4	0 49.7	-45.6	117.4	0 22.2	-46.3	117.4	0 05.5	-46.8	117.4	0 33.1	-47.4	117.4	1 20.5	+4.7	62.6	1 00.6	+4.8	62.6	1 28.2	+4.8	62.6	18
19	0 32.3	-45.1	118.0	0 04.1	-45.7	118.0	0 24.1	+4.6	118.0	0 52.3	+4.8	118.0	0 52.3	+4.8	118.0	1 48.6	+4.8	118.0	2 16.8	+4.8	118.0	2 44.9	+4.9	118.0	19
20	0 12.8	+45.1	61.3	0 41.6	+45.7	61.3	1 10.4	+46.2	61.3	1 39.1	+46.9	61.4	2 07.9	+47.4	61.4	2 36.6	+48.0	61.4	3 05.3	+48.5	61.5	3 33.9	+49.1	61.5	20
21	0 57.9	+45.0	60.7	1 27.3	+45.6	60.7	1 55.6	+46.3	60.7	2 26.0	+46.8	60.7	2 55.3	+47.4	60.8	3 24.6	+47.9	60.8	3 53.8	+48.5	60.9	4 23.0	+49.0	60.9	21
22	1 42.9	+45.1	60.0	2 12.9	+45.7	60.0	2 42.9	+46.2	60.1	3 12.8	+46.8	60.1	3 42.7	+47.3	60.2	4 12.5	+47.9	60.2	4 42.3	+48.4	60.3	5 12.0	+49.0	60.4	22
23	2 28.0	+45.0	59.3	2 58.6	+45.6	59.4	3 29.1	+46.2	59.4	3 59.6	+46.8	59.5	4 30.0	+47.4	59.5	5 00.4	+47.9	59.6	5 30.7	+48.4	59.7	6 01.0	+48.9	59.8	23
24	3 13.0	+45.0	58.7	3 44.2	+45.6	58.7	4 15.3	+46.2	58.8	4 46.4	+46.7	58.9	5 17.4	+47.2	58.9	5 48.3	+47.8	59.0	6 19.1	+48.4	59.1	6 49.9	+48.5	59.2	24
25	3 58.0	+45.0	58.0	4 29.8	+45.5	58.1	5 01.5	+46.1	58.1	5 33.1	+46.7	58.2	6 04.6	+47.3	58.3	6 36.1	+47.8	58.4	7 07.5	+48.3	58.5	7 38.8	+48.9	58.6	25
26	4 43.0	+44.9	57.3	5 15.3	+45.5	57.4	5 47.6	+46.1	57.5	6 19.8	+46.6	57.6	6 51.9	+47.2	57.7	7 23.9	+47.8	57.8	7 55.8	+48.3	57.9	8 27.7	+48.8	58.0	26
27	5 27.9	+44.9	56.7	6 00.8	+45.6	56.8	6 33.7	+46.0	56.9	7 06.4	+46.6	57.0	7 39.1	+47.1	57.1	8 11.7	+47.6	57.2	8 44.1	+48.2	57.3	9 16.5	+48.7	57.4	27
28	6 12.8	+44.8	56.0	6 46.3	+45.4	56.1	7 19.7	+46.0	56.2	7 53.0	+46.5	56.3	8 26.2	+47.1	56.4	8 59.3	+47.7	56.6	9 32.3	+48.2	56.7	10 05.2	+48.7	56.9	28
29	6 57.6	+44.8	55.3	7 31.7	+45.5	55.4	8 05.7	+45.9	55.6	8 39.5	+46.5	55.7	9 13.3	+47.0	55.8	9 47.0	+47.5	56.0	10 20.5	+48.1	56.1	10 53.9	+48.6	56.3	29
30	7 42.4	+44.7	54.7	8 17.0	+45.3	54.8	8 51.6	+45.8	54.9	9 26.0	+46.4	55.0	10 00.3	+47.0	55.2	10 34.5	+47.5	55.3	11 08.6	+48.0	55.5	11 42.5	+48.5	55.7	30
31	8 27.1	+44.7	54.0	9 02.3	+45.2	54.1	9 37.4	+45.8	54.3	10 12.4	+46.3	54.4	10 47.3	+46.8	54.6	11 22.0	+47.4	54.7	11 56.6	+47.9	54.9	12 31.0	+48.5	55.1	31
32	9 11.8	+44.5	53.3	9 47.5	+45.2	53.5	10 23.2	+45.7	53.6	10 58.7	+46.3	53.8	11 34.1	+46.8	53.9	12 09.4	+47.3	54.1	12 44.5	+47.9	54.3	13 19.5	+48.4	54.5	32
33	9 56.3	+44.5	52.6	10 32.7	+45.0	52.8	11 08.9	+45.6	52.9	11 45.0	+46.1	53.1	12 20.9	+46.7	53.3	12 56.7	+47.3	53.5	13 32.4	+47.7	53.6	14 07.9	+48.2	53.8	33
34	10 40.8	+44.4	52.0	11 17.7	+45.0	52.1	11 54.5	+45.5	52.3	12 31.1	+46.1	52.5	13 07.6	+46.6	52.6	13 44.0	+47.1	52.8	14 20.1	+47.7	53.0	14 56.1	+48.2	53.2	34
35	11 25.2	+44.3	51.3	12 02.7	+44.8	51.4	12 40.0	+45.4	51.6	13 17.2	+46.0	51.8	13 54.2	+46.5	52.0	14 31.1	+47.0	52.2	15 07.8	+47.6	52.4	15 44.3	+48.1	52.6	35
36	12 09.5	+44.2	50.6	12 47.5	+44.8	50.8	13 25.4	+45.3	50.9	14 03.2	+45.8	51.1	14 40.7	+47.2	51.4	15 18.1	+46.9	51.5	15 55.4	+47.4	51.8	16 32.4	+48.0	52.0	36
37	12 53.7	+44.1	49.9	13 32.3	+44.6	50.1	14 10.7	+45.2	50.3	14 49.0	+45.7	50.5	15 27.1	+46.3	50.7	16 05.0	+46.8</td								

70°, 290° L.H.A.

LATITUDE SAME NAME AS DECLINATION

{ L.H.A. greater than 180°Zn=Z
N. Lat. { L.H.A. less than 180°Zn=360°-Z }

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			Dec.	
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z		
0	13 59.7 +43.7	104.4	13 44.7 +44.3	104.7	13 29.3 +45.1	104.9	13 13.8 +45.7	105.1	12 58.0 +46.4	105.4	12 42.0 +47.1	105.6	12 25.8 +47.7	105.8	12 09.3 +48.4	106.0	0	0	0	0	0	0	0	0	0	
1	14 43.4 +43.5	103.7	14 29.0 +44.3	104.0	14 14.4 +45.0	104.2	13 59.5 +45.7	104.5	13 44.4 +46.3	104.7	13 29.1 +46.9	104.9	13 13.5 +47.6	105.2	12 57.7 +48.2	105.4	1	1	1	1	1	1	1	1	1	
2	15 26.9 +43.4	103.0	15 13.3 +44.1	103.3	14 59.4 +44.8	103.5	14 45.2 +45.5	103.8	14 30.7 +46.2	104.1	14 16.0 +46.9	104.3	14 01.1 +47.5	104.5	13 45.9 +48.2	104.8	2	2	2	2	2	2	2	2	2	
3	16 10.3 +43.3	102.3	15 57.4 +44.0	102.6	15 44.2 +44.7	102.9	15 30.7 +45.4	103.1	15 16.9 +46.1	103.4	15 02.9 +46.8	103.7	14 48.6 +47.4	103.9	14 34.1 +48.0	104.2	3	3	3	3	3	3	3	3	3	
4	16 53.6 +43.1	101.6	16 41.4 +43.8	101.9	16 28.9 +44.4	102.2	16 16.1 +45.3	102.4	16 03.0 +46.0	102.7	15 49.7 +46.4	103.0	15 36.0 +47.3	103.3	15 22.1 +48.0	103.5	4	4	4	4	4	4	4	4	4	
5	17 36.7 +42.9	100.8	17 25.2 +43.7	101.2	17 13.5 +44.4	101.5	17 01.4 +45.1	101.8	16 49.0 +45.8	102.1	16 36.3 +46.5	102.4	16 23.3 +47.2	102.6	16 10.1 +47.8	102.9	5	5	5	5	5	5	5	5	5	
6	18 19.6 +42.8	100.1	18 08.9 +43.5	100.4	17 57.9 +44.2	100.8	17 46.5 +45.0	101.1	17 34.8 +45.7	101.4	17 22.8 +46.4	101.7	17 10.5 +47.1	102.0	16 57.9 +47.7	102.3	6	6	6	6	6	6	6	6	6	
7	19 02.4 +42.5	99.4	18 52.4 +43.4	99.7	18 42.1 +44.1	100.0	18 31.5 +44.8	100.4	18 20.5 +45.6	100.7	18 09.2 +46.3	101.0	17 57.6 +46.9	101.3	17 45.6 +47.6	101.7	7	7	7	7	7	7	7	7	7	
8	19 44.9 +42.4	98.6	19 35.8 +43.1	99.0	19 26.2 +44.0	99.3	19 16.3 +44.7	99.7	19 06.1 +45.4	100.0	18 55.5 +46.1	100.4	18 44.5 +46.8	100.7	18 33.2 +47.5	101.0	8	8	8	8	8	8	8	8	8	
9	20 27.3 +42.2	97.9	20 18.9 +43.0	98.2	20 10.2 +43.7	98.6	20 01.0 +44.5	99.0	19 51.5 +45.2	99.3	19 41.6 +45.9	99.7	19 31.3 +46.6	100.0	19 20.7 +47.3	100.4	9	9	9	9	9	9	9	9	9	
10	21 09.5 +42.0	97.1	21 01.9 +42.8	97.5	20 53.9 +43.6	97.9	20 45.5 +44.3	98.2	20 36.7 +45.1	98.6	20 27.5 +45.8	99.0	20 17.9 +46.5	99.4	20 08.0 +47.2	99.7	10	10	10	10	10	10	10	10	10	
11	21 51.5 +41.8	96.3	21 44.7 +42.6	96.7	21 37.5 +43.3	97.1	21 29.8 +44.1	97.5	21 21.8 +44.8	97.9	21 13.3 +45.6	98.3	21 04.4 +46.4	98.7	20 55.2 +47.0	99.1	11	11	11	11	11	11	11	11	11	
12	22 33.3 +41.6	95.6	22 27.3 +42.4	96.0	22 20.8 +43.2	96.4	22 13.9 +44.0	96.8	22 06.6 +44.7	97.1	21 58.9 +44.9	97.6	21 50.8 +45.1	98.0	21 42.2 +46.9	98.4	12	12	12	12	12	12	12	12	12	
13	23 14.9 +41.3	94.8	23 09.7 +42.1	95.2	23 04.0 +42.9	95.6	22 57.9 +43.7	96.1	22 51.3 +44.5	96.5	22 44.3 +45.3	96.9	22 36.9 +46.0	97.3	22 29.1 +46.7	97.7	13	13	13	13	13	13	13	13	13	
14	23 56.2 +41.1	94.0	23 51.8 +41.9	94.4	23 46.9 +42.7	94.9	23 41.6 +43.5	95.3	23 35.8 +44.3	95.7	23 29.6 +45.0	96.2	23 22.9 +45.8	96.6	23 15.8 +46.5	97.0	14	14	14	14	14	14	14	14	14	
15	24 37.3 +40.8	93.2	24 33.7 +41.6	93.6	24 29.6 +42.5	94.1	24 25.1 +43.3	94.6	24 20.1 +44.1	95.0	24 14.6 +44.9	95.5	24 08.7 +45.6	95.9	24 02.3 +46.3	96.3	15	15	15	15	15	15	15	15	15	
16	25 18.1 +40.5	92.4	25 15.3 +41.4	92.9	25 12.1 +42.2	93.3	25 08.4 +43.0	93.8	25 04.2 +43.8	94.3	24 59.5 +44.6	94.7	24 54.3 +45.4	95.2	24 48.6 +46.2	95.7	16	16	16	16	16	16	16	16	16	
17	25 58.6 +40.3	91.6	25 56.7 +41.2	92.1	25 54.3 +42.0	92.5	25 51.4 +42.8	93.0	25 48.0 +43.6	93.5	25 44.1 +44.0	94.0	25 39.7 +45.2	94.5	25 34.8 +45.9	94.9	17	17	17	17	17	17	17	17	17	
18	26 38.9 +40.0	90.7	26 37.9 +40.8	91.2	26 36.3 +41.7	91.7	26 34.2 +42.6	92.2	26 31.6 +43.4	92.7	26 28.5 +44.2	93.2	26 24.9 +44.9	93.7	26 20.7 +45.7	94.2	18	18	18	18	18	18	18	18	18	
19	27 18.9 +39.7	89.9	27 18.7 +40.6	90.4	27 18.0 +41.4	90.9	27 16.8 +42.2	91.4	27 15.0 +43.1	92.0	27 12.7 +43.9	92.5	27 09.8 +44.7	93.0	27 06.4 +45.5	93.5	19	19	19	19	19	19	19	19	19	
20	27 58.6 +39.3	89.1	27 59.3 +40.2	89.6	27 59.4 +41.2	90.1	27 59.0 +42.0	90.6	27 58.1 +42.8	91.1	27 56.6 +43.5	91.7	27 54.5 +44.5	92.2	27 51.9 +45.2	92.8	20	20	20	20	20	20	20	20	20	
21	28 37.9 +39.1	88.2	28 39.5 +40.0	88.7	28 40.6 +40.8	89.3	28 41.0 +41.7	89.8	28 40.9 +42.6	90.4	28 40.2 +43.4	90.9	28 39.0 +44.2	91.5	28 37.1 +45.0	92.0	21	21	21	21	21	21	21	21	21	
22	29 17.0 +38.7	87.3	29 19.5 +39.6	87.9	29 21.4 +40.5	88.5	29 22.7 +41.4	89.0	29 23.5 +42.2	89.6	29 23.6 +43.1	90.1	29 23.2 +43.9	90.7	29 22.1 +44.8	91.3	22	22	22	22	22	22	22	22	22	
23	29 55.7 +38.3	86.4	29 59.1 +39.2	86.8	30 42.1 +39.9	86.7	30 45.2 +40.5	87.3	30 47.6 +41.7	87.9	30 49.5 +42.5	88.5	30 50.7 +43.4	89.1	30 51.3 +44.2	89.7	23	23	23	23	23	23	23	23	23	
24	30 34.0 +38.0	85.6	30 38.3 +39.0	86.1	31 49.0 +36.9	86.7	31 57.5 +37.8	87.2	34 02.5 +38.2	87.0	34 27.6 +39.8	87.9	34 18.6 +40.7	88.3	34 24.2 +41.7	89.0	24	24	24	24	24	24	24	24	24	
25	31 12.0 +37.6	84.7	31 17.3 +38.5	85.3	31 21.9 +39.5	85.9	31 25.9 +40.4	86.5	31 29.3 +41.2	87.1	31 32.0 +42.2	87.7	31 34.1 +43.0	88.3	31 35.5 +43.9	88.9	25	25	25	25	25	25	25	25	25	
26	31 49.6 +37.2	83.7	31 55.8 +38.1	84.4	32 01.4 +39.1	85.0	32 06.3 +40.0	85.6	32 10.5 +41.0	86.2	32 14.2 +41.8	86.9	32 17.1 +42.7	87.5	32 19.4 +43.6	88.1	26	26	26	26	26	26	26	26	26	
27	32 26.8 +36.7	82.8	32 33.9 +37.8	83.4	32 40.5 +38.7	84.1	32 46.3 +39.6	84.7	32 51.5 +40.6	85.4	32 56.0 +41.5	86.0	32 59.8 +42.4	86.7	33 03.0 +43.2	87.3	27	27	27	27	27	27	27	27	27	
28	33 03.5 +36.4	81.9	33 11.7 +37.3	82.5	33 19.3 +38.3	83.2	33 25.9 +39.3	83.8	33 32.1 +40.1	84.5	33 37.5 +41.1	85.1	33 42.2 +42.0	85.8	33 46.2 +43.0	86.5	28	28	28	28	28	28	28	28	28	
29	33 36.0 +33.9	77.0	36 13.8 +35.0	77.7	36 26.3 +36.0	78.4	36 38.0 +37.0	79.1	36 48.9 +38.0	79.9	36 59.1 +39.0	80.6	37 06.7 +40.0	81.4	37 38.5 +40.0	81.4	37 17.1 +41.0	82.1	33	33	33	33	33	33	33	33
30	34 15.8 +35.4	80.0	34 25.9 +36.5	80.6	34 35.3 +37.5	81.3	34 44.0 +38.5	82.0	34 52.0 +39.4	82.7	34 59.3 +40.4	83.4	35 05.9 +41.2	84.1	35 11.7 +42.2	84.8	30	30	30	30	30	30	30	30	30	
31	34 51.2 +35.0	79.0	35 02.4 +35.9	79.7	35 12.8 +37.0	80.4	35 22.5 +37.9	81.1	35 31.4 +38.9	81.8	35 39.7 +39.8	82.5	35 47.1 +40.9	83.2	35 53.9 +41.8	83.9	31	31	31	31	31	31	31	31	31	
32	35 26.2 +34.5	78.0	35 38.3 +35.5	78.7	35 49.8 +36.5	79.4	36 00.4 +37.6	80.1	36 10.4 +38.5	80.8	36 19.6 +39.5	81.5	36 28.0 +40.5	82.3	36 35.7 +41.4	83.0	32	32	32	32	32	32	32	32	32	
33	36 00.7 +33.9	77.0	36 13.8 +35.0	77.7	36 26.3 +36.0	78.4	36 38.0 +37.0	79.1	36 48.9 +38.0	79.9	36 59.1 +39.0	80.6	37 08.5 +40.0	81.4	37 18.7 +40.0	82.1	33	33	33	33	33	33	33	33	33	
34	36 34.6 +33.5	76.0	36 48.8 +34.5	76.7	37 02.3 +35.5	77.4	37 15.0 +36.5	78.2																		

LATITUDE CONTRARY NAME TO DECLINATION **L.H.A. 70°, 290°**

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			Dec.							
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z								
0	13 59.7 -43.8	104.4	13 44.7 -44.5	104.7	13 29.3 -45.1	104.9	13 13.8 -45.9	105.1	12 58.0 -46.5	105.4	12 42.0 -47.2	105.6	12 25.8 -47.8	105.8	12 09.3 -48.4	106.0	0	13 15.9 -43.9	105.1	13 00.2 -44.6	105.4	12 27.9 -45.9	105.8	12 38.0 -47.9	106.4	11 20.9 -48.4	106.6	1				
1	9 35.4 -44.3	108.6	9 16.2 -45.0	108.8	8 56.9 -45.7	108.9	8 37.3 -46.3	109.1	12 11.5 -46.6	106.0	11 54.8 -47.2	106.2	11 38.0 -47.9	106.4	11 20.9 -48.4	106.6	1	12 32.0 -44.0	105.8	12 15.6 -44.7	106.0	11 58.9 -45.4	106.3	11 42.0 -46.1	106.5	11 24.9 -46.7	106.7	10 50.1 -47.9	107.0	10 32.5 -48.6	107.2	3
2	8 51.1 -44.5	109.3	8 31.2 -45.1	109.4	8 11.2 -45.8	109.6	7 51.0 -46.4	109.7	7 30.7 -47.0	109.8	7 10.3 -47.6	109.9	6 43.7 -47.0	110.4	6 22.7 -47.7	110.6	6 56.7 -47.2	111.1	5 35.0 -47.7	111.2	5 13.3 -48.3	111.3	4 51.5 -48.8	111.3	9							
3	8 06.6 -44.5	110.0	7 46.1 -44.9	107.4	10 28.0 -45.5	107.6	10 09.8 -46.2	107.8	6 39.6 -45.9	110.9	6 18.2 -46.5	111.0	9 04.6 -46.9	108.6	8 45.4 -47.5	108.7	8 17.7 -47.0	109.2	7 57.9 -47.6	109.3	6 49.8 -48.2	110.1	6 29.2 -48.8	110.2	7							
4	7 22.1 -44.6	110.6	7 00.9 -45.2	110.8	6 39.6 -45.9	110.9	6 18.2 -46.5	111.0	5 56.7 -47.2	111.1	5 35.0 -47.7	111.2	5 13.3 -48.3	111.3	4 51.5 -48.8	111.3	9	11 03.9 -44.2	107.2	11 46.1 -44.9	107.4	9 32.9 -47.5	108.1	9 14.2 -48.1	108.2	8 55.3 -48.7	108.4	8				
5	10 19.7 -44.3	107.9	10 01.2 -45.0	108.1	9 42.5 -45.6	108.2	9 23.6 -46.3	108.4	9 04.6 -46.9	108.6	8 45.4 -47.5	108.7	8 17.7 -47.0	109.2	7 57.9 -47.6	109.3	6 49.8 -48.2	110.1	6 29.2 -48.8	110.2	7 17.9 -48.7	109.6	6									
6	9 35.4 -44.3	108.6	9 16.2 -45.0	108.8	8 56.9 -45.7	108.9	8 37.3 -46.3	109.1	7 51.0 -46.4	109.7	7 10.3 -47.6	109.9	6 43.7 -47.0	110.4	6 22.7 -47.7	110.6	6 56.7 -47.2	111.1	5 35.0 -47.7	111.2	5 13.3 -48.3	111.3	4 51.5 -48.8	111.3	9							
7	8 51.1 -44.5	109.3	8 31.2 -45.1	109.4	8 11.2 -45.8	109.6	7 51.0 -46.4	109.7	7 30.7 -47.0	109.8	7 10.3 -47.6	109.9	6 43.7 -47.0	110.4	6 22.7 -47.7	110.6	6 56.7 -47.2	111.1	5 35.0 -47.7	111.2	5 13.3 -48.3	111.3	4 51.5 -48.8	111.3	9							
8	8 06.6 -44.5	110.0	7 46.1 -44.9	107.4	7 25.4 -45.1	110.2	7 04.6 -46.4	110.3	6 43.7 -47.0	110.4	6 22.7 -47.7	110.6	5 56.7 -47.2	111.1	5 35.0 -47.7	111.2	5 13.3 -48.3	111.3	4 51.5 -48.8	111.3	9	9 22.1 -44.6	110.6	9 00.9 -45.2	110.8	8 39.6 -45.9	110.9	8 14.2 -48.1	108.2	8 55.3 -48.7	108.4	8
9	7 22.1 -44.6	110.6	7 00.9 -45.2	110.8	6 39.6 -45.9	110.9	6 18.2 -46.5	111.0	5 56.7 -47.2	111.1	5 35.0 -47.7	111.2	5 13.3 -48.3	111.3	4 51.5 -48.8	111.3	9	11 03.9 -44.2	107.2	11 46.1 -44.9	107.4	9 32.9 -47.5	108.1	9 14.2 -48.1	108.2	8 55.3 -48.7	108.4	8				
10	6 37.5 -44.6	111.3	6 15.7 -45.3	111.4	5 53.7 -45.9	111.5	5 31.7 -46.5	111.6	5 09.5 -47.1	111.7	4 47.3 -47.7	111.8	4 22.4 -47.2	112.3	3 59.6 -47.8	112.4	3 36.7 -48.3	112.4	3 13.8 -48.9	112.5	3 36.7 -48.3	112.4	3 13.8 -48.9	112.5	11							
11	5 52.9 -44.7	112.0	5 30.4 -45.3	112.1	5 07.8 -45.9	112.2	4 45.2 -46.6	112.2	4 16.9 -47.2	112.2	3 35.2 -47.2	112.8	3 11.8 -47.8	113.0	2 48.4 -48.4	113.0	2 24.9 -48.9	113.1	2 24.9 -48.9	113.1	2 24.9 -48.9	113.1	12									
12	5 08.2 -44.7	112.7	4 45.1 -45.4	112.8	4 21.9 -45.6	112.8	3 58.6 -46.6	112.9	2 48.0 -47.2	113.6	2 24.0 -47.8	113.6	2 00.8 -47.2	114.2	1 36.2 -47.8	114.2	1 11.6 -48.3	114.2	0 47.0 -48.9	114.2	0 47.0 -48.9	114.2	14									
13	4 23.5 -44.7	113.3	3 59.7 -45.3	113.4	3 35.9 -46.0	113.4	3 12.0 -46.6	113.5	2 48.0 -47.2	113.6	2 24.0 -47.8	113.6	2 00.8 -47.2	114.2	1 36.2 -47.8	114.2	1 11.6 -48.3	114.2	0 23.3 -48.4	114.8	0 01.9 +49.0	65.2	15									
14	3 38.8 -44.8	114.0	3 14.4 -45.5	114.0	2 49.9 -46.0	114.1	2 25.4 -46.7	114.1	1 08.1 +47.3	63.4	1 35.0 +47.8	63.4	1 55.4 +47.2	62.7	2 22.8 +47.8	62.8	2 05.1 +48.4	64.6	0 50.9 +48.9	64.6	0 50.9 +48.9	64.6	16									
15	2 54.0 -44.8	114.7	2 28.9 -45.4	114.7	2 03.9 -46.1	114.7	1 38.7 -46.6	114.8	1 08.1 +47.3	63.4	1 35.0 +47.8	63.4	1 55.4 +47.2	62.7	2 28.7 +48.9	63.4	2 01.9 +48.3	63.4	2 28.7 +48.9	63.4	18											
16	2 09.2 -44.8	115.3	1 43.5 -45.4	115.4	1 17.8 -46.0	115.4	0 52.1 -46.7	115.4	0 26.4 -47.3	115.4	0 00.6 -47.8	115.4	0 20.9 +47.2	64.0	0 47.2 +47.8	64.0	0 25.1 +48.4	64.6	0 50.9 +48.9	64.6	0 50.9 +48.9	64.6	17									
17	1 24.4 -44.9	116.0	0 58.1 -45.5	116.0	0 31.8 -46.1	116.0	0 05.4 -46.6	116.0	0 20.9 +47.2	64.0	0 47.2 +47.8	64.0	0 25.1 +48.4	64.6	0 50.9 +48.9	64.6	0 20.9 +48.3	64.6	0 50.9 +48.9	64.6	18											
18	0 39.5 -44.8	116.7	0 12.6 -45.4	116.7	0 14.3 +46.1	63.3	0 41.2 +46.7	63.4	1 00.4 +46.0	62.7	1 27.9 +46.6	62.7	1 55.4 +47.2	62.7	2 22.8 +47.8	62.8	2 05.2 +48.4	62.8	3 17.6 +48.9	62.9	3 17.6 +48.9	62.9	19									
19	0 05.3 +44.8	62.7	0 32.8 +45.5	62.7	1 00.4 +46.0	62.7	1 27.9 +46.6	62.7	1 55.4 +47.2	62.7	2 22.8 +47.8	62.8	2 05.2 +48.4	62.8	3 17.6 +48.9	62.9	3 17.6 +48.9	62.9	3 17.6 +48.9	62.9	19											
20	0 50.1 +44.9	62.0	1 18.3 +45.4	62.0	1 46.4 +46.0	62.1	2 14.5 +46.6	62.1	2 42.6 +47.2	62.1	3 10.6 +47.8	62.2	3 38.6 +48.3	62.2	4 06.5 +48.8	62.3	2 42.6 +47.2	62.1	4 26.9 +48.3	61.6	4 55.4 +48.8	61.6	4 55.4 +48.8	61.6	20							
21	1 35.0 +44.8	61.4	2 03.7 +45.4	61.4	2 32.4 +46.1	61.4	3 01.1 +46.6	61.5	3 29.8 +47.1	61.5	3 58.4 +47.7	61.6	4 26.9 +48.3	61.6	5 15.2 +48.2	61.0	5 44.2 +48.8	61.1	2 21	2 19.8 +44.8	60.7	2 48.4 +47.2	60.7	2 21	2 19.8 +44.8	60.7	2 21	2 19.8 +44.8	60.7	2 21		
22	2 19.8 +44.8	60.7	2 49.1 +45.4	60.7	3 18.5 +46.0	60.8	3 47.7 +46.6	60.8	4 16.9 +46.7	60.9	4 46.1 +47.7	61.0	5 04.1 +47.1	60.3	5 33.8 +47.7	60.4	6 03.4 +48.3	60.4	6 33.0 +48.8	60.5	6 51.7 +48.1	59.8	7 21.8 +48.7	59.9	24							
23	3 04.6 +44.8	60.0	3 34.5 +45.4	60.1	4 04.5 +45.9	60.1	4 34.3 +46.5	60.2	5 04.1 +47.1	60.3	5 33.8 +47.7	60.4	6 51.2 +47.1	59.6	6 21.5 +47.6	59.7	7 23.6 +44.5	59.8	7 23.6 +44.5	59.8	7 23.6 +44.5	59.8	25									
24	3 49.4 +44.7	59.4	4 19.9 +45.4	59.4	4 50.4 +45.4	59.5	5 20.8 +46.5	59.6	6 43.0 +46.8	59.6	6 15.1 +46.5	59.7	6 51.7 +48.1	59.8	7 21.8 +48.7	59.9	7 21.8 +48.7	59.9	7 21.8 +48.7	59.9	24											
25	4 34.1 +44.7	58.7	5 05.3 +45.3	58.8	5 36.3 +45.9	58.8	6 07.3 +46.5	58.9	7 09.1 +47.6	59.1	7 39.8 +48.2	59.2	8 10.5 +48.6	59.4	8 38.3 +48.2	59.6	9 28.0 +48.0	59.6	9 59.1 +48.6	59.8	9 59.1 +48.6	59.8	26									
26	5 18.8 +44.7	58.0	5 50.6 +45.2	58.1	6 22.2 +45.9	58.2	6 53.8 +46.4	58.3	7 25.3 +47.0	58.4	7 56.7 +47.5	58.5	8 28.0 +48.0	58.6	8 59.1 +48.6	58.8	9 16.0 +48.0	58.0	9 47.7 +48.6	58.2	27											
27	6 03.5 +44.6	57.3	6 35.8 +45.2	57.4	7 08.1 +45.7	57.5	7 40.2 +46.4	57.7	8 12.3 +46.9	57.8	8 44.2 +47.5	57.9	9 16.0 +48.0	58.0	9 47.7 +47.7	57.8	10 04.0 +48.0	57.4	10 36.3 +48.4	57.6	10 36.3 +48.4	57.6	28									
28	6 48.1 +44.5	56.7	7 21.0 +45.2	56.8	7 53.8 +45.7	56.9	8 26.6 +46.2	57.0	8 59.2 +46.8	56.9	9 31.7 +47.4	57.3	10 04.0 +48.0	57.4	10 40.4 +48.0	57.4	10 40.4 +48.0	57.4	10 40.4 +48.0	57.4	29											
29	7 32.6 +44.5	56.0	8 06.2 +45.0	56.1	8 39.5 +45.5	56.2	9 12.8 +46.3	56.4	9 46.0 +46.8	56.5	10 19.1 +47.3	56.7	12 25.6 +44.9	56.5	12 52.0 +44.9	56.5	12 52.0 +44.9	56.5	12 52.0 +44.9	56.5	29											
30	8 17.1 +44.5	55.3	8 51.2 +45.0	55.4	9 25.2 +45.6	55.6	9 59.1 +46.1	55.7	10 32.8 +46.7	55.9	11 06.4 +47.2	56.0	11 39.8 +47.8	56.2	12 13.1 +48.4	56.4	12 13.1 +48.4	56.4	12 13.1 +48.4	56.4	30											
31	9 01.6 +44.3</																															

71°, 289° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180°Zn=Z
L.H.A. less than 180°Zn=360°-Z

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			Dec.			
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z				
0	13	18.6	+43.5	103.7	13	04.3	+44.2	103.9	12	49.7	+45.0	104.1	12	35.0	+45.6	104.4	12	20.0	+46.3	104.6	12	04.8	+46.9	104.8	11	33.8	+48.2	105.2
1	14	02.1	+43.4	103.0	13	48.5	+44.1	103.2	13	34.7	+44.8	103.5	13	20.6	+45.5	103.7	13	06.3	+46.2	103.9	12	51.7	+46.9	104.1	12	37.0	+47.5	104.4
2	14	45.5	+43.3	102.3	14	32.6	+44.1	102.5	14	19.5	+44.7	102.8	14	06.1	+45.4	103.0	13	52.5	+46.1	103.3	13	38.6	+46.8	103.5	13	10.1	+48.1	104.0
3	15	28.8	+43.1	101.5	15	16.7	+43.8	101.8	15	04.2	+44.6	102.1	14	51.5	+45.3	102.3	14	38.6	+46.0	102.6	14	25.4	+46.6	102.9	14	11.9	+47.3	103.3
4	16	11.9	+43.0	100.8	16	00.5	+43.8	101.1	15	48.8	+44.5	101.4	15	36.8	+45.2	101.7	15	24.6	+45.8	101.9	15	12.0	+46.4	102.2	14	59.2	+47.2	102.5
5	16	54.9	+42.9	100.1	16	44.3	+43.6	100.4	16	33.3	+44.3	100.7	16	22.0	+45.1	101.0	16	10.4	+45.8	101.3	15	58.6	+46.4	101.5	15	34.0	+47.7	102.1
6	17	37.8	+42.7	99.4	17	27.9	+43.4	99.7	17	17.6	+44.2	100.0	17	07.1	+44.9	100.3	16	56.2	+45.6	100.6	16	45.0	+46.3	100.9	16	33.5	+47.0	101.2
7	18	20.5	+42.5	98.6	18	11.3	+43.3	98.9	18	01.8	+44.0	99.3	17	52.0	+44.7	99.6	17	41.8	+45.5	99.9	17	31.3	+46.2	100.2	17	20.5	+46.9	100.8
8	19	03.0	+42.3	97.9	18	54.6	+43.1	98.2	18	45.8	+43.9	98.6	18	36.7	+44.6	98.9	18	27.3	+45.3	99.2	18	17.5	+46.7	99.9	17	56.9	+47.4	100.2
9	19	45.3	+42.1	97.1	19	37.7	+42.9	97.5	19	29.7	+43.6	97.8	19	21.3	+44.4	98.2	19	12.6	+45.1	98.5	19	03.5	+45.9	98.9	18	54.1	+46.5	99.2
10	20	27.4	+41.9	96.4	20	20.6	+42.7	96.7	20	13.3	+43.5	97.1	20	05.7	+44.3	97.5	19	57.7	+45.0	97.8	19	49.4	+45.7	98.2	19	40.6	+46.5	98.5
11	21	09.3	+41.8	95.6	21	03.3	+42.5	96.0	20	56.8	+43.3	96.4	20	50.0	+44.0	96.7	20	42.7	+44.8	97.1	20	35.1	+45.5	97.5	20	27.1	+46.2	97.9
12	21	51.1	+41.5	94.8	21	45.8	+42.3	95.2	21	40.1	+43.1	95.6	21	34.0	+43.9	96.0	21	27.5	+44.7	96.4	21	20.6	+46.2	97.2	21	05.6	+46.8	97.6
13	22	32.6	+41.3	94.1	22	28.1	+42.1	94.5	22	23.2	+42.9	94.9	22	17.9	+43.7	95.3	22	12.2	+44.4	95.7	22	06.0	+45.2	96.1	21	59.4	+46.0	96.5
14	23	13.9	+41.0	93.3	23	10.2	+41.9	93.7	23	06.1	+42.7	94.1	23	01.6	+43.5	94.5	22	56.6	+44.3	95.0	22	51.2	+45.0	95.4	22	45.4	+45.7	95.8
15	23	54.9	+40.8	92.5	23	52.1	+41.6	92.9	23	48.8	+42.4	93.4	23	45.1	+43.2	93.8	23	40.9	+44.0	94.0	23	36.2	+44.8	94.7	23	31.1	+45.6	95.1
16	24	35.7	+40.5	91.7	24	33.7	+41.4	92.1	24	31.2	+42.3	92.6	24	28.3	+43.0	93.0	24	24.9	+43.8	93.5	24	21.0	+44.6	93.9	24	16.7	+45.3	94.4
17	25	16.2	+40.3	90.8	25	15.1	+41.1	91.3	25	13.5	+41.9	91.8	25	11.3	+42.8	92.3	25	08.7	+43.6	92.7	25	05.6	+44.4	93.2	25	02.0	+45.2	93.7
18	25	56.5	+40.0	90.0	25	56.2	+40.8	90.5	25	55.4	+41.7	91.0	25	54.1	+42.5	91.5	25	52.3	+43.3	92.0	25	50.0	+44.1	92.5	25	47.2	+44.9	92.9
19	26	36.5	+39.7	89.2	26	37.0	+40.6	89.7	26	37.1	+41.4	90.2	26	36.6	+42.3	90.7	26	35.6	+43.1	91.2	26	34.1	+43.9	91.7	26	32.1	+44.7	92.2
20	27	16.2	+39.3	88.4	27	17.6	+40.3	88.9	27	18.5	+41.2	89.4	27	18.9	+42.0	89.0	27	18.7	+42.8	90.4	27	18.0	+43.7	90.9	27	16.8	+44.4	91.5
21	27	55.5	+39.1	87.5	27	57.9	+39.9	88.0	27	59.7	+40.8	88.6	28	0.9	+41.7	89.1	28	01.5	+42.6	89.6	28	01.7	+43.3	90.2	28	01.2	+44.2	90.7
22	28	34.6	+38.7	86.6	28	37.8	+39.7	87.2	28	40.5	+40.5	87.7	28	42.6	+41.4	88.3	28	44.1	+42.3	88.8	28	45.0	+43.1	89.4	28	45.2	+44.7	90.5
23	29	13.3	+38.4	85.8	29	17.5	+39.3	86.3	29	21.0	+40.2	86.9	29	24.0	+41.1	87.5	29	26.4	+42.9	88.0	29	29.3	+43.7	89.1	29	29.9	+44.5	89.7
24	29	51.7	+38.1	84.9	29	56.8	+38.9	85.5	30	01.2	+39.9	86.0	30	05.1	+40.7	86.6	30	08.3	+41.7	87.2	30	11.0	+42.5	87.8	30	13.0	+43.3	88.4
25	30	29.8	+37.6	84.0	30	35.7	+38.6	84.6	30	41.1	+39.5	85.2	30	45.8	+40.5	85.8	30	50.0	+41.3	86.4	30	53.5	+42.2	87.0	30	56.3	+43.1	87.6
26	31	07.4	+37.3	83.1	31	14.3	+38.3	83.7	31	20.6	+39.2	84.3	31	26.3	+40.0	84.9	31	31.3	+41.0	85.5	31	35.7	+41.8	86.1	31	39.4	+42.7	86.7
27	31	44.7	+36.9	82.2	31	52.6	+37.8	82.8	31	59.8	+38.8	83.4	32	06.3	+39.9	84.0	32	12.3	+40.6	84.6	32	17.5	+41.6	85.3	32	22.1	+42.5	85.9
28	32	21.6	+36.4	81.2	32	30.4	+37.4	81.9	32	38.6	+38.3	82.5	32	46.1	+39.3	83.1	32	52.9	+40.3	83.8	32	59.1	+41.1	84.4	33	04.6	+42.0	85.7
29	32	58.0	+36.1	80.3	33	07.8	+37.0	80.9	33	16.3	+38.0	81.6	33	25.4	+38.9	82.2	33	33.2	+39.8	82.9	33	40.2	+40.8	83.5	33	46.6	+41.7	84.2
30	33	34.1	+35.5	79.3	33	44.8	+36.6	80.0	33	54.9	+37.6	80.7	34	04.3	+38.5	81.3	34	13.0	+39.5	82.0	34	21.0	+40.5	82.7	34	34.9	+42.3	84.0
31	34	09.6	+35.2	78.4	34	21.4	+36.1	79.0	34	32.5	+37.1	79.7	34	42.8	+38.1	80.4	34	52.5	+39.1	81.1	35	01.5	+40.9	82.5	35	17.2	+41.9	83.2
32	34	44.8	+34.6	77.4	34	57.5	+35.7	78.1	35	09.6	+36.6	78.8	35	20.9	+37.7	79.4	35	31.6	+38.6	80.1	35	41.5	+39.5	80.9	35	50.6	+40.6	81.6
33	35	19.4	+34.1	76.4	35	33.2	+35.1	77.1	35	46.2	+36.2	77.8	36	10.2	+37.1	78.5	36	21.0	+39.2	79.9	36	31.2	+40.1	80.7	36	40.5	+41.1	81.4
34	35	53.5	+33.7	75.4	36	08.3	+34.7	76.1	36	22.4	+35.7	76.8	36	35.7	+36.7	77.5	36	48.3	+37.7	78.2	37	00.2	+38.7	79.0	37	11.3	+39.7	79.7
35	36	27.2	+33.0	74.3	36	43.0	+34.1	75.1	36	58.1	+35.1	75.8	37	12.4	+36.2	76.5	37	26.0	+37.3	77.3	37	38.9	+38.2	78.0	37	51.0	+39.2	78.8
36	37	00.2	+32.6	73.3	37	17.1	+33.6	74.0	37	33.2	+34.7	74.8	37	48.6	+35.7	75.5	38	03.3	+36.7	76.3	38	17.1	+37.7	77.0	38	30.2	+38.7	77.8
37	37	32.8	+31.9	72.3	37	50.7	+33.0	73.0	38	07.9	+34.1	73.7	38	24.3	+35.1	74.5	38	40.0	+36.1	75.3	38	54.8	+37.2	76.0	39	08.9	+38.2	76.8
38	38	04.7	+31.4	71.2	38	23.7	+32.5	71.9	38	42.0	+33.5	72.7	38	59.4	+34.6	73.5	39	16.1	+35.6	74.2	39							

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 71° , 289°

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			Dec.
	Hc	d	Z																						
0	13 18.6 -43.7	103.7		13 04.3 -44.4	103.9		12 49.7 -45.0	104.1		12 35.0 -45.8	104.4		12 20.0 -46.4	104.6		12 04.8 -47.1	104.8		11 49.4 -47.7	105.0		11 33.8 -48.3	105.2		0
1	12 34.9 -43.7	104.4		12 19.9 -44.5	104.6		12 04.7 -45.2	104.8		11 49.2 -45.8	105.0		11 33.6 -46.5	105.2		11 17.7 -47.1	105.4		11 01.7 -47.8	105.6		10 45.5 -48.4	105.8		1
2	11 51.2 -43.9	105.1		11 35.4 -44.5	105.3		11 19.5 -45.2	105.5		11 03.4 -45.9	105.7		10 47.1 -46.6	105.9		10 30.6 -47.2	106.0		10 13.9 -47.8	106.2		9 57.1 -48.4	106.4		3
3	11 07.3 -44.0	105.8		10 50.9 -44.7	106.0		10 34.3 -45.4	106.2		10 17.5 -46.0	106.3		10 00.5 -46.6	106.5		9 43.4 -47.3	106.7		9 26.1 -47.9	106.8		9 08.7 -48.5	107.0		4
4	10 23.3 -44.0	106.5		10 06.2 -44.7	106.7		9 48.9 -45.4	106.8		9 13.5 -46.1	107.0		9 13.9 -46.7	107.1		8 56.1 -47.3	107.3		8 38.2 -47.9	107.4		8 20.2 -48.6	107.6		4
5	9 39.3 -44.2	107.2		9 21.5 -44.8	107.3		9 03.5 -45.4	107.5		8 45.4 -46.1	107.6		8 27.2 -46.8	107.8		8 08.8 -47.4	107.9		7 50.3 -48.0	108.0		7 31.6 -48.6	108.2		5
6	8 55.1 -44.2	107.9		8 36.7 -44.9	108.0		8 18.1 -45.6	108.1		7 59.3 -46.2	108.3		7 40.4 -46.8	108.4		7 21.4 -47.4	108.5		7 02.3 -48.1	108.7		6 43.0 -48.6	108.8		6
7	8 10.9 -44.2	108.5		7 51.8 -45.0	108.7		7 32.5 -45.8	108.8		7 13.1 -46.2	108.9		6 53.6 -46.9	109.0		6 34.0 -47.5	109.1		6 14.2 -48.0	109.3		5 54.4 -48.7	109.4		7
8	7 26.7 -44.4	109.2		7 06.8 -45.0	109.3		6 46.9 -45.7	109.5		6 26.9 -46.3	109.6		6 06.7 -46.9	109.7		5 46.5 -47.5	109.8		5 26.2 -48.2	109.9		5 05.7 -48.7	109.9		8
9	6 42.3 -44.4	109.9		6 21.8 -45.0	110.0		6 01.3 -45.7	110.1		5 40.6 -46.3	110.2		5 19.8 -46.9	110.3		4 59.0 -47.6	110.4		4 38.0 -48.1	110.5		4 17.0 -48.7	110.5		9
10	5 57.9 -44.4	110.6		5 36.8 -45.1	110.7		5 15.6 -45.8	110.8		4 54.3 -46.4	110.8		4 32.9 -47.0	110.9		4 11.4 -47.6	111.0		3 49.9 -48.2	111.1		3 28.3 -48.7	111.1		10
11	5 13.5 -44.5	111.2		4 51.7 -45.1	111.3		4 29.8 -45.7	111.4		4 07.9 -46.4	111.5		3 45.9 -47.0	111.5		3 23.8 -47.6	111.6		3 01.7 -48.2	111.7		2 39.6 -48.8	111.7		11
12	4 29.0 -44.5	111.9		4 06.6 -45.2	112.0		3 44.1 -45.9	112.1		2 58.9 -46.2	112.2		2 36.2 -47.6	112.2		1 50.8 -48.8	112.3		1 23.5 -48.2	112.3		1 0.8 -48.8	112.3		12
13	3 44.5 -44.6	112.6		3 21.4 -45.2	112.7		2 58.2 -45.8	112.7		2 35.1 -46.5	112.7		2 11.9 -47.1	112.8		1 48.6 -47.6	112.8		1 25.3 -48.2	112.8		1 02.0 -48.8	112.9		13
14	2 59.9 -44.6	113.3		2 36.2 -45.2	113.3		2 12.4 -45.8	113.3		1 48.6 -46.4	113.4		1 24.8 -47.1	113.4		1 01.0 -47.7	113.4		0 37.1 -48.2	113.4		0 13.2 -48.8	113.4		14
15	2 15.3 -44.6	113.9		1 51.0 -45.3	114.0		1 26.6 -45.9	114.0		1 02.2 -46.5	114.0		0 51.5 -46.5	114.6		0 37.7 -47.0	114.0		0 13.3 -47.6	114.0		0 35.6 +48.7	66.0		15
16	1 30.7 -44.6	114.6		1 05.7 -45.2	114.6		0 40.7 -45.8	114.6		0 15.7 -46.5	114.6		0 09.3 +47.1	65.4		0 34.3 +47.7	65.4		0 59.3 +48.3	65.4		1 24.3 +48.8	65.4		16
17	0 46.1 -44.6	115.3		0 20.5 -45.2	115.3		0 05.1 +45.9	64.7		0 30.8 +46.4	64.7		0 56.4 +47.0	64.7		1 22.0 +47.6	64.8		1 47.6 +48.2	64.8		2 13.1 +48.8	64.8		17
18	0 01.5 -44.6	115.9		0 24.7 +45.3	64.1		0 51.0 +45.8	64.1		1 17.2 +46.5	64.1		1 43.4 +47.1	64.1		2 09.6 +47.6	64.1		2 35.8 +48.1	64.2		3 01.9 +48.7	64.2		18
19	0 43.1 +44.6	63.4		1 10.0 +45.2	63.4		1 36.8 +45.9	63.4		2 03.7 +46.4	63.5		2 30.5 +47.0	63.5		2 57.2 +47.6	63.5		3 23.9 +48.2	63.6		3 50.6 +48.7	63.6		19
20	1 27.7 +44.6	62.7		1 55.2 +45.2	62.7		2 22.7 +45.8	62.8		2 50.1 +46.4	62.8		3 17.5 +47.0	62.9		3 44.8 +47.6	62.9		4 12.1 +48.1	63.0		4 39.3 +48.7	63.1		20
21	2 12.3 +44.6	62.1		2 04.4 +45.2	62.1		3 08.5 +45.8	62.1		3 36.5 +46.4	62.2		4 04.5 +47.0	62.2		4 32.4 +47.5	62.3		5 00.2 +48.1	62.4		5 28.0 +48.7	62.5		21
22	2 56.9 +44.6	61.4		3 25.6 +45.2	61.4		3 54.3 +45.8	61.5		4 22.9 +46.4	61.6		4 51.5 +46.9	61.6		5 19.9 +47.5	61.7		5 48.3 +48.1	61.8		6 16.7 +48.6	61.9		22
23	3 41.5 +44.5	60.7		4 10.8 +45.1	60.8		4 40.1 +45.7	60.8		5 09.3 +46.3	60.9		5 38.4 +46.9	61.0		6 07.4 +47.5	61.1		6 36.4 +48.0	61.2		7 05.3 +48.6	61.3		23
24	4 26.0 +44.5	60.0		4 55.9 +45.1	60.1		5 25.8 +45.7	60.2		5 55.6 +46.3	60.3		6 25.3 +46.8	60.4		6 54.9 +47.4	60.5		7 24.4 +48.0	60.6		7 53.9 +48.5	60.7		24
25	5 10.5 +44.4	59.4		5 41.0 +45.1	59.4		6 11.5 +45.6	59.5		6 41.9 +46.2	59.6		7 12.1 +46.8	59.7		7 42.3 +47.4	59.9		8 12.4 +47.9	60.0		8 42.4 +48.4	60.1		25
26	5 54.9 +44.4	58.7		6 26.1 +45.0	58.8		6 57.1 +45.6	58.9		7 28.1 +46.2	59.0		7 58.9 +46.8	59.1		8 29.7 +47.3	59.2		9 00.3 +47.9	59.2		9 30.8 +48.4	59.5		26
27	6 39.3 +44.4	58.0		7 11.1 +44.9	58.1		7 42.7 +45.5	58.2		8 14.3 +46.1	58.3		8 45.7 +46.7	58.5		9 17.0 +47.2	58.6		9 48.2 +47.8	58.8		10 19.2 +48.4	58.9		27
28	7 23.7 +44.3	57.3		7 56.0 +44.9	57.4		8 28.2 +45.5	57.6		9 00.4 +46.0	57.7		9 32.4 +46.7	57.8		10 04.2 +47.2	58.0		10 36.0 +47.7	58.1		11 07.6 +48.2	58.3		28
29	8 08.0 +44.2	56.7		8 40.9 +44.8	56.8		9 13.7 +45.4	56.9		9 46.4 +46.0	57.1		10 19.0 +46.5	57.2		11 23.7 +47.6	57.5		11 55.8 +48.2	57.7		12 53.1 +48.7	57.9		29
30	8 52.2 +44.1	56.0		9 25.7 +44.7	56.1		9 59.1 +45.3	56.2		10 32.4 +45.8	56.4		11 05.5 +46.4	56.6		11 38.5 +47.0	56.7		12 11.3 +47.6	56.9		12 44.0 +48.1	57.1		30
31	9 36.3 +44.1	55.3		10 10.4 +44.7	55.4		10 44.4 +45.2	55.6		11 18.2 +45.8	55.7		11 51.9 +46.4	55.9		12 25.5 +46.9	56.1		12 58.9 +47.5	56.3		13 32.1 +48.0	56.5		31
32	10 20.4 +43.9	54.6		11 55.1 +44.5	54.7		11 29.6 +45.2	54.9		12 04.0 +45.7	55.1		12 38.3 +46.3	55.3		13 12.4 -46.8	55.4		13 46.4 -47.3	55.4		14 33.7 +47.3	55.5		32
33	11 04.3 +43.9	53.9		11 39.6 +44.5	54.1		12 14.8 +45.0	54.2		12 49.7 +45.6	54.4		13 24.6 +46.1	54.6		13 59.2 +46.8	54.8		14 33.7 +47.3	54.9		15 08.0 +47.9	55.2		33
34	11 48.2 +43.8	53.2		12 24.1 +44.3	53.4		12 59.8 +44.9	53.6		13 35.3 +45.5	53.8		14 10.7 +46.1	53.9		15 21.0 +47.2	54.2		15 55.9 +47.7	54.6		16 21.4 +48.0	54.7		34
35	12 32.0 +43.6	52.5		13 08.4 +44.3	52.7		13 44.7 +44.8	52.9		14 20.8 +45.4	53.1		14 56.8 +45.9	53.3		15 32.6 +46.5	53.5		16 08.2 +47.0	53.7		16 43.6 +47.5	54.0		35
36	13 15.6 +43.6	51.8		13 52.7 +44.1	52.0		14 29.5 +44.7	52.2		15 06.2 +45.3	52.4		15 42.7 +45.9	52.6		16 19.1 +46.3	52.8		16 55.2 +46.9	53.1		17 31.1 +47.5	53.3		36
37	13 59.2 +43.4	51.1		14 36.8 +44.0	51.3		15 14.2 +44.6	51.5		15 51.5 +45.1	51.7		16 28.6 +45.6	51.9		17 05.4 +46.3	52.2		17 42.1 +46.8	52.4		18 18.6 +47.3	52.7		37
38																									

72°, 288° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180°Zn=Z
L.H.A. less than 180°Zn=360°-Z

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			Dec.								
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z									
0	12	37.3	+43.4	102.9	12	23.7	+44.2	103.2	12	10.0	+44.8	103.4	11	56.0	+45.5	103.6	11	41.8	+46.2	103.8	11	27.4	+46.9	104.0	10	58.0	+48.2	104.4	0				
1	13	20.7	+43.3	102.2	13	07.9	+44.0	102.5	12	54.8	+44.7	102.7	12	41.5	+45.4	102.9	12	28.0	+46.1	103.1	12	14.3	+46.7	103.3	12	00.3	+47.4	103.5	11	46.2	+48.0	103.8	1
2	14	04.0	+43.2	101.5	13	51.9	+43.9	101.8	13	39.5	+44.7	102.0	13	26.9	+45.4	102.2	13	14.1	+46.0	102.5	13	01.0	+46.7	102.7	12	34.2	+48.0	103.1	2				
3	14	47.2	+43.0	100.8	14	35.8	+43.8	101.1	14	24.2	+44.5	101.3	14	12.3	+45.2	101.6	14	00.1	+45.9	101.8	13	47.7	+46.6	102.1	13	22.2	+47.8	102.5	3				
4	15	30.2	+42.9	100.1	15	19.6	+43.6	100.4	15	08.7	+44.3	100.6	14	57.5	+45.1	100.9	14	46.0	+45.8	101.1	14	34.3	+46.4	101.4	14	22.3	+47.1	101.7	4				
5	16	13.1	+42.8	99.4	16	03.2	+43.5	99.6	15	53.0	+44.3	99.9	15	42.6	+44.9	100.2	15	31.8	+45.6	100.5	15	20.7	+46.4	100.7	15	09.4	+47.0	101.0	14	57.8	+47.7	101.3	5
6	16	55.9	+42.6	98.6	16	46.7	+43.4	98.9	16	37.3	+44.1	99.2	16	27.5	+44.8	99.5	16	17.4	+45.6	99.8	16	07.1	+46.2	100.1	15	56.4	+46.9	100.4	15	45.5	+47.6	100.6	6
7	17	38.5	+42.4	97.9	17	30.1	+43.2	98.2	17	21.4	+43.9	98.5	17	12.3	+44.7	98.8	17	03.0	+45.4	99.1	16	53.3	+46.1	99.4	16	43.3	+46.8	99.7	16	33.1	+47.4	100.0	7
8	18	20.9	+42.2	97.1	18	13.3	+43.0	97.5	18	05.3	+43.8	97.8	17	57.0	+44.5	98.1	17	48.4	+45.2	98.4	17	39.4	+46.0	98.8	17	30.1	+46.7	99.1	17	20.5	+47.3	99.4	8
9	19	03.1	+42.1	96.4	18	56.3	+42.8	96.7	18	49.1	+43.6	97.1	18	41.5	+44.4	97.4	18	33.6	+45.1	97.7	18	25.4	+45.8	98.1	18	16.8	+46.5	98.4	18	07.8	+47.2	98.7	9
10	19	45.2	+41.9	95.6	19	39.1	+42.7	96.0	19	32.7	+43.4	96.3	19	25.9	+44.2	96.7	19	18.7	+44.9	97.0	19	11.2	+45.6	97.4	19	03.3	+46.3	97.7	18	55.0	+47.1	98.1	10
11	20	27.1	+41.7	94.9	20	21.8	+42.5	95.2	20	16.1	+43.3	95.6	20	10.1	+44.0	96.0	20	03.6	+44.8	96.3	19	56.8	+45.5	96.7	19	49.6	+46.2	97.1	19	42.1	+46.9	97.4	11
12	21	08.8	+41.4	94.1	21	04.3	+42.2	94.5	20	59.4	+43.0	94.9	20	54.1	+43.8	95.3	20	48.4	+44.6	95.6	20	24.3	+45.3	96.0	20	35.8	+46.1	96.4	20	29.0	+46.7	96.8	12
13	21	50.2	+41.3	93.3	21	46.5	+42.1	93.7	21	42.4	+42.9	94.1	21	37.9	+43.7	94.5	21	33.0	+44.4	94.9	21	27.6	+45.2	95.3	21	21.9	+45.9	95.7	21	15.7	+46.6	96.1	13
14	22	31.5	+41.0	92.5	22	28.6	+41.8	93.0	22	25.3	+42.6	93.4	22	21.6	+43.4	93.8	22	17.4	+44.2	94.2	22	12.8	+45.0	94.6	22	07.8	+45.7	95.0	22	02.3	+46.5	95.4	14
15	23	12.5	+40.8	91.7	23	10.4	+41.6	92.2	23	07.9	+42.5	92.6	23	05.0	+43.2	93.0	23	01.6	+44.0	93.5	22	57.8	+44.7	93.9	22	53.5	+45.5	94.3	22	48.8	+46.2	94.7	15
16	23	53.3	+40.5	90.9	23	52.0	+41.4	91.4	23	50.4	+42.1	91.8	23	48.2	+43.0	92.3	23	45.6	+43.8	92.7	23	42.5	+44.6	93.2	23	39.0	+45.3	93.6	23	35.0	+46.1	94.0	16
17	24	33.8	+40.3	90.1	24	34.4	+41.1	90.6	24	32.5	+42.0	91.1	24	31.2	+42.8	91.5	24	29.4	+43.5	92.0	24	27.1	+43.3	92.4	24	24.3	+45.1	92.9	24	21.1	+45.8	93.3	17
18	25	14.1	+39.9	89.3	25	14.5	+40.9	89.8	25	14.5	+41.7	90.3	25	14.0	+42.5	90.7	25	12.9	+43.4	91.2	25	11.4	+44.2	91.7	25	09.4	+44.9	92.1	25	06.9	+45.7	92.6	18
19	25	54.0	+39.8	88.5	25	55.4	+40.5	89.0	25	56.2	+41.4	89.5	25	56.5	+42.2	90.0	25	56.3	+43.1	90.4	25	55.6	+43.8	90.9	25	54.3	+44.7	91.4	25	52.6	+45.4	91.9	19
20	26	33.8	+39.4	87.7	26	35.9	+40.3	88.2	26	37.6	+41.2	88.7	26	38.7	+42.0	89.2	26	39.4	+42.8	89.7	26	39.4	+43.7	90.2	26	39.0	+44.5	90.7	26	38.0	+45.3	91.2	20
21	27	13.2	+39.1	86.8	27	16.2	+40.0	87.3	27	18.8	+40.8	87.8	27	20.7	+41.7	88.4	27	22.2	+42.5	88.9	27	23.1	+43.4	89.4	27	23.5	+44.1	89.9	27	23.3	+45.0	90.4	21
22	27	52.3	+38.7	86.0	27	56.2	+39.7	86.5	27	59.6	+40.6	87.0	28	0.25	+41.4	87.5	28	0.47	+42.3	88.1	28	0.65	+43.1	88.6	28	07.6	+44.0	89.1	28	08.3	+44.7	89.7	22
23	28	31.0	+38.5	85.1	28	35.9	+39.3	85.6	28	40.2	+40.2	86.0	28	43.9	+41.8	86.7	28	47.0	+42.0	87.3	28	49.6	+42.8	87.8	28	51.6	+43.6	88.4	28	53.0	+44.5	88.9	23
24	29	09.5	+38.1	84.2	29	15.2	+39.1	84.8	29	20.4	+39.8	85.3	29	25.0	+40.8	85.9	29	29.0	+41.7	86.5	29	32.4	+42.4	87.0	29	35.2	+44.2	88.2	29	37.5	+44.2	88.8	24
25	29	47.6	+37.7	83.3	29	54.3	+38.6	83.9	30	0.03	+39.6	84.5	30	0.58	+40.5	85.0	30	10.7	+41.4	85.6	30	15.0	+42.2	86.2	30	18.6	+43.1	86.8	30	21.7	+43.9	87.4	25
26	30	25.3	+37.4	82.4	30	32.9	+38.3	83.0	30	39.9	+39.3	83.6	30	46.3	+40.1	84.2	30	52.1	+41.9	84.8	30	57.2	+41.9	85.4	31	01.7	+42.8	86.0	31	05.6	+43.6	86.6	26
27	31	02.7	+37.0	81.5	31	11.2	+38.0	82.1	31	19.2	+38.8	82.7	31	26.4	+39.8	83.3	31	33.1	+40.7	83.9	31	39.1	+41.6	84.5	31	44.5	+42.5	85.2	31	49.2	+43.4	85.8	27
28	31	39.7	+36.6	80.6	31	49.2	+37.5	81.2	31	58.0	+38.5	81.8	32	06.2	+39.4	82.4	32	13.8	+40.3	83.1	32	20.7	+41.2	83.7	32	27.0	+42.1	84.3	32	32.6	+43.0	85.0	28
29	32	16.3	+36.1	79.7	32	26.7	+37.1	80.3	32	36.5	+38.1	80.9	32	45.6	+39.1	81.6	32	54.1	+40.0	82.2	33	01.9	+40.9	82.8	33	09.1	+41.8	83.5	33	15.6	+42.6	84.1	29
30	32	52.4	+35.7	78.7	33	03.8	+36.7	79.4	33	14.6	+37.6	80.0	33	24.7	+38.6	80.6	33	34.1	+39.6	81.3	33	42.8	+40.5	82.0	33	50.9	+41.4	82.6	33	58.2	+42.3	83.3	30
31	33	28.1	+35.3	77.8	33	40.5	+36.3	78.4	33	52.2	+37.3	79.1	34	03.3	+38.2	79.7	34	13.7	+39.1	80.4	34	23.3	+40.1	81.1	34	32.3	+41.0	81.7	34	40.5	+42.0	82.4	31
32	34	03.4	+34.8	76.8	34	16.8	+35.8	77.4	34	29.5	+36.3	78.0	34	41.5	+37.8	78.8	34	52.6	+38.8	79.5	35	03.4	+39.7	80.2	35	13.3	+40.7	80.9	35	22.5	+41.6	81.6	32
33	34	38.2	+34.3	75.8	34	52.6	+35.3	76.5	35	06.3	+36.3	77.2	35	19.3	+37.3	77.8	35	31.6	+38.3	78.5	35	43.1	+39.3	79.2	35	54.0							

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 72° , 288°

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			Dec.								
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z									
0	12	37.3	-43.5	102.9	12	23.7	-44.2	103.2	12	10.0	-45.0	103.4	11	56.0	-45.6	103.6	11	41.8	-46.3	103.8	11	27.4	-46.9	104.0	11	12.8	-47.5	104.2	10	58.0	-48.2	104.4	0
1	11	53.8	-43.7	103.6	11	39.5	-44.3	103.8	11	25.0	-45.0	104.0	11	10.4	-45.7	104.2	10	55.5	-46.3	104.4	10	40.5	-47.0	104.6	10	25.3	-47.7	104.8	10	09.8	-48.2	105.0	1
2	11	10.1	-43.7	104.3	10	55.2	-44.5	104.5	10	40.0	-45.1	104.7	10	24.7	-45.8	104.9	10	09.2	-46.5	105.1	9	53.5	-47.1	105.2	9	37.6	-47.7	105.4	9	21.6	-48.3	105.6	3
3	10	26.4	-43.8	105.0	10	10.7	-44.5	105.2	9	54.9	-45.2	105.4	9	38.9	-45.9	105.6	9	22.7	-46.5	105.7	9	06.4	-47.2	105.9	8	49.9	-47.8	106.0	8	33.3	-48.4	106.2	3
4	9	42.6	-43.9	105.7	9	26.2	-44.6	105.9	9	09.7	-45.3	106.1	8	53.0	-45.9	106.2	8	36.2	-46.8	106.3	8	19.2	-47.2	106.5	8	02.1	-47.8	106.6	7	44.9	-48.4	106.8	4
5	8	58.7	-44.0	106.4	8	41.6	-44.7	106.6	8	24.4	-45.3	106.7	8	07.1	-46.0	106.9	7	49.6	-46.6	107.0	7	32.0	-47.2	107.1	7	14.3	-47.9	107.2	6	56.5	-48.5	107.4	5
6	8	14.7	-44.1	107.1	7	56.9	-44.7	107.2	7	39.1	-45.4	107.4	7	21.1	-46.0	107.5	7	03.0	-46.7	107.6	6	44.8	-47.3	107.7	6	08.0	-48.5	108.0	6				
7	7	30.6	-44.1	107.8	7	12.2	-44.8	107.9	6	53.7	-45.5	108.0	6	35.1	-46.1	108.2	6	16.3	-46.7	108.3	5	57.5	-47.4	108.4	5	38.5	-47.9	108.5	7				
8	6	46.5	-44.2	108.5	6	27.4	-44.8	108.6	6	08.2	-45.5	108.7	5	49.0	-46.2	108.8	5	29.6	-46.8	108.9	5	10.1	-47.4	109.0	4	50.6	-48.0	109.1	8				
9	6	02.3	-44.2	109.2	5	42.6	-44.9	109.3	5	22.7	-45.5	109.4	5	02.8	-46.2	109.4	4	42.8	-46.8	109.5	4	22.7	-47.4	109.6	3	42.4	-48.6	109.7	9				
10	5	18.1	-44.3	109.8	4	57.7	-44.9	109.9	4	37.2	-45.6	110.0	4	16.6	-46.2	110.1	3	56.0	-46.8	110.1	3	35.3	-47.4	110.2	3	14.6	-48.1	110.3	2	53.8	-48.7	110.3	10
11	4	33.8	-44.3	110.5	4	12.8	-45.0	110.6	3	51.6	-45.6	110.7	3	30.4	-46.2	110.7	3	09.2	-46.9	110.8	2	47.9	-47.5	110.8	2	26.5	-48.0	110.9	2	05.1	-48.6	110.9	11
12	3	49.5	-44.3	111.2	3	27.8	-45.0	111.3	3	06.0	-45.6	111.3	2	44.2	-46.3	111.4	2	22.3	-46.8	111.4	2	00.4	-47.4	111.4	1	38.5	-48.1	111.5	12				
13	3	05.2	-44.4	111.9	2	42.8	-45.0	111.9	2	20.4	-45.6	112.0	1	57.9	-46.2	112.0	1	35.5	-46.9	112.0	0	50.4	-48.0	112.1	0	27.9	-48.7	112.1	13				
14	2	20.8	-44.4	112.5	1	57.8	-45.0	112.6	1	34.8	-45.7	112.6	1	11.7	-46.3	112.6	0	48.6	-46.8	112.6	0	25.5	-47.5	112.7	0	02.4	-48.1	112.7	14				
15	1	36.4	-44.4	113.2	1	12.8	-45.1	113.2	0	49.1	-45.7	113.3	0	25.4	-46.3	113.3	0	01.7	-46.9	113.3	0	22.0	+4.75	66.7	0	45.7	+48.1	66.7	15				
16	0	52.0	-44.4	113.9	0	27.7	-45.0	113.9	0	03.4	-46.6	113.9	0	20.9	+4.63	66.1	0	45.2	+46.9	66.1	1	33.8	+4.80	66.1	1	58.0	+48.6	66.2	16				
17	0	07.6	-44.4	114.6	0	17.3	+45.0	65.4	0	42.2	+45.7	65.4	0	17.2	+46.2	65.5	1	32.1	+46.8	65.5	1	57.0	+47.4	65.5	2	21.8	+48.1	65.5	17				
18	0	36.8	+44.4	64.8	1	0.2	+43.1	64.8	1	27.1	+45.6	64.8	1	53.4	+46.3	64.8	2	18.9	+46.9	64.9	2	44.4	+47.5	64.9	3	03.9	+48.0	64.9	18				
19	1	21.2	+44.4	64.1	1	47.4	+45.0	64.1	2	13.5	+45.7	64.1	2	39.7	+46.2	64.2	3	05.8	+46.8	64.2	3	31.9	+47.4	64.3	4	23.8	+48.6	64.4	19				
20	2	05.6	+44.3	63.4	2	32.4	+45.0	63.5	2	59.2	+45.6	63.5	3	25.9	+46.2	63.5	3	52.6	+46.8	63.6	4	19.3	+47.4	63.7	5	12.4	+48.5	63.8	20				
21	2	49.9	+44.4	62.7	3	17.4	+45.0	62.8	3	44.8	+45.6	62.8	4	12.1	+46.2	62.9	4	39.4	+46.8	63.0	5	06.7	+47.3	63.1	5	33.8	+47.9	63.1	21				
22	3	34.3	+44.3	62.1	4	02.4	+44.9	62.1	4	30.4	+45.5	62.2	5	45.8	+46.2	62.3	5	26.2	+46.7	62.3	5	54.0	+47.3	62.4	6	21.7	+47.9	62.5	22				
23	4	18.6	+44.3	61.4	4	47.3	+44.9	61.5	5	15.9	+45.5	61.5	6	44.5	+46.1	61.6	6	12.9	+46.7	61.7	6	41.3	+47.3	61.8	7	09.6	+47.8	61.9	23				
24	5	02.9	+44.2	60.7	5	32.2	+44.8	60.8	6	01.4	+45.4	60.9	6	30.6	+46.0	61.0	6	59.6	+46.7	61.1	7	28.6	+47.2	61.2	7	57.4	+47.8	61.3	24				
25	5	47.1	+44.2	60.0	6	17.0	+44.8	60.1	6	46.9	+45.4	60.2	7	16.6	+46.0	60.3	7	46.3	+46.5	60.5	8	15.8	+47.2	60.6	8	45.2	+47.7	60.7	9				
26	6	31.3	+44.1	59.4	7	01.8	+44.8	59.5	7	32.3	+45.3	59.6	8	02.6	+46.0	59.7	8	32.8	+46.8	59.8	9	03.0	+47.0	59.9	9	32.9	+47.7	60.1	10	02.8	+48.2	60.2	25
27	7	15.4	+44.1	58.7	7	46.6	+44.7	58.8	8	17.6	+45.3	58.9	8	48.6	+45.8	59.0	9	19.4	+46.4	59.2	9	50.0	+47.1	59.3	10	20.6	+47.6	59.5	10	51.0	+48.1	59.6	27
28	7	59.5	+44.0	58.0	8	31.3	+44.6	58.1	9	02.9	+45.2	58.2	9	34.4	+45.8	58.4	10	05.8	+46.4	58.5	10	37.1	+46.9	58.7	11	08.2	+47.5	58.9	11	39.1	+48.1	59.0	28
29	8	43.5	+44.0	57.3	9	15.9	+45.4	57.4	9	48.1	+45.1	57.6	10	20.2	+45.7	57.7	10	52.2	+46.3	57.9	11	24.0	+46.9	58.1	11	55.7	+47.4	58.2	12	27.2	+48.0	58.4	29
30	9	27.5	+43.8	56.6	10	00.4	+44.5	56.8	10	33.2	+45.1	56.9	11	05.9	+45.7	57.1	11	38.5	+46.2	57.2	12	10.9	+46.7	57.4	12	43.1	+47.3	57.6	13				
31	10	11.3	+43.8	55.9	10	44.9	+44.3	56.1	11	18.3	+44.9	56.2	11	51.6	+45.5	56.4	12	24.7	+46.1	56.6	12	57.6	+46.7	56.8	13	30.4	+47.3	57.0	14	03.0	+47.8	57.2	31
32	10	55.1	+43.7	55.2	11	29.2	+43.2	55.4	12	03.2	+43.4	55.6	12	37.1	+45.4	55.7	13	10.8	+46.0	55.9	13	44.3	+46.6	56.1	14	17.7	+47.1	56.3	14	50.8	+47.7	56.6	32
33	11	38.8	+43.5	54.5	12	13.5	+44.2	54.7	12	48.1	+44.7	54.9	13	22.5	+45.4	55.1	13	56.8	+45.9	55.3	14	30.9	+46.5	55.5	15	48.0	+47.0	55.7	15	38.5	+47.6	55.9	33
34	12	22.3	+43.5	53.8	12	57.7	+44.0	54.0	13	32.8	+44.7	54.2	14	07.9	+45.2	54.4	14	42.7	+45.8	54.6	15	17.4	+46.3	54.8	15	51.8	+46.9	55.1	16	26.1	+47.5	55.3	34
35	13	05.8	+43.3	53.1	13	41.7	+43.9	53.3	14	17.5	+44.5	53.5	14	53.1	+45.1	53.7	15	28.5	+45.7	53.9	16	03.7	+46.2	54.2	16	38.7	+46.8	54.4	17	13.6	+47.3	54.7	35
36	14																																

73°, 287° L.H.A.

LATITUDE SAME NAME AS DECLINATION

{ L.H.A. greater than 180°Zn=Z
N. Lat. { L.H.A. less than 180°Zn=360°-Z }

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			Dec.	
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z		
0	11 55.9 +43.3	102.2	11 43.1 +44.0	102.4	11 30.1 +44.7	102.6	11 16.9 +45.4	102.8	11 03.5 +46.1	103.0	10 49.9 +46.8	103.2	10 36.2 +47.4	103.4	10 22.2 +48.0	103.5	0	11 22.2 +48.0	103.5	11 10.2 +48.0	102.9	11 10.2 +48.0	102.9	1		
1	12 39.2 +43.2	101.5	12 27.1 +43.9	101.7	12 14.8 +44.7	101.9	12 02.3 +45.4	102.1	11 49.6 +46.0	102.3	11 36.7 +46.7	102.5	11 23.6 +47.3	102.7	11 10.2 +48.0	102.9	1	12 39.2 +43.2	101.5	12 27.1 +43.9	101.7	12 14.8 +44.7	101.9	12 02.3 +45.4	102.1	1
2	13 22.4 +43.1	100.8	13 11.0 +43.8	101.0	12 59.5 +44.5	101.2	12 47.7 +45.2	101.5	12 35.6 +45.9	101.7	12 23.4 +46.5	101.9	12 10.9 +47.2	102.1	12 58.2 +47.9	102.3	2	13 22.4 +43.1	100.8	13 11.0 +43.8	101.0	12 59.5 +44.5	101.2	12 47.7 +45.2	101.5	2
3	14 05.5 +42.9	100.1	13 54.8 +43.7	100.3	13 44.0 +44.4	100.5	13 32.9 +45.1	100.8	13 21.5 +45.8	101.0	13 09.9 +46.5	101.3	12 58.1 +47.2	101.5	12 46.1 +47.7	101.7	3	14 05.5 +42.9	100.1	13 54.8 +43.7	100.3	13 44.0 +44.4	100.5	13 32.9 +45.1	100.8	3
4	14 48.4 +42.8	99.3	14 38.5 +43.6	99.6	14 28.4 +44.3	99.9	14 18.0 +45.0	100.1	14 07.3 +45.7	100.4	13 56.4 +47.0	100.6	13 45.3 +47.7	100.8	13 33.8 +47.7	101.1	4	14 48.4 +42.8	99.3	14 38.5 +43.6	99.6	14 28.4 +44.3	99.9	14 18.0 +45.0	100.1	4
5	15 31.2 +42.7	98.6	15 22.1 +43.4	98.9	15 12.7 +44.1	99.2	15 03.0 +44.9	99.4	14 53.0 +45.6	99.7	14 42.8 +46.3	99.9	14 32.3 +46.9	100.2	14 21.5 +47.6	100.5	5	15 31.2 +42.7	98.6	15 22.1 +43.4	98.9	15 12.7 +44.1	99.2	15 03.0 +44.9	99.4	5
6	16 13.9 +42.5	97.9	16 05.5 +43.3	98.2	15 56.8 +44.1	98.5	15 47.9 +44.7	98.7	15 38.6 +45.5	99.0	15 29.1 +46.1	99.3	15 19.2 +46.9	99.6	15 09.1 +47.5	99.8	6	16 13.9 +42.5	97.9	16 05.5 +43.3	98.2	15 56.8 +44.1	98.5	15 47.9 +44.7	98.7	6
7	16 56.4 +42.4	97.1	16 48.8 +43.1	97.4	16 40.9 +43.8	97.7	16 32.6 +44.6	98.0	16 24.1 +45.3	98.3	16 15.2 +46.0	98.6	16 06.1 +46.7	98.9	15 56.6 +47.4	99.2	7	16 56.4 +42.4	97.1	16 48.8 +43.1	97.4	16 40.9 +43.8	97.7	16 32.6 +44.6	98.0	7
8	17 38.8 +42.2	96.4	17 31.9 +43.0	96.7	17 24.7 +43.7	97.0	17 17.2 +44.5	97.3	17 09.4 +45.2	97.7	17 01.2 +45.9	98.0	16 52.8 +46.6	98.3	16 44.0 +47.3	98.6	8	17 38.8 +42.2	96.4	17 31.9 +43.0	96.7	17 24.7 +43.7	97.0	17 17.2 +44.5	97.3	8
9	18 21.0 +42.0	95.7	18 14.9 +42.8	96.0	18 08.4 +43.6	96.3	18 01.7 +44.3	96.6	17 54.6 +45.0	97.0	17 47.1 +45.8	97.3	17 39.4 +46.4	97.6	17 31.3 +47.1	97.9	9	18 21.0 +42.0	95.7	18 14.9 +42.8	96.0	18 08.4 +43.6	96.3	18 01.7 +44.3	96.6	9
10	19 03.0 +41.8	94.9	18 57.7 +42.6	95.2	18 52.0 +43.4	95.6	18 46.0 +44.1	95.9	18 39.6 +44.9	96.3	18 32.9 +45.6	96.6	18 25.8 +46.3	96.9	18 18.4 +47.0	97.3	10	19 03.0 +41.8	94.9	18 57.7 +42.6	95.2	18 52.0 +43.4	95.6	18 46.0 +44.1	95.9	10
11	19 44.8 +41.6	94.1	19 40.3 +42.4	94.5	19 35.4 +43.2	94.9	19 30.1 +44.0	95.2	19 24.5 +44.7	95.6	19 18.5 +45.4	95.9	19 12.1 +46.2	96.3	19 05.4 +46.9	96.6	11	19 44.8 +41.6	94.1	19 40.3 +42.4	94.5	19 35.4 +43.2	94.9	19 30.1 +44.0	95.2	11
12	20 26.4 +41.5	93.4	20 22.7 +42.2	93.7	20 18.6 +43.0	94.1	20 14.1 +43.8	94.5	20 09.2 +44.5	94.9	20 03.9 +45.3	95.2	19 58.3 +46.0	95.6	19 52.3 +46.7	95.9	12	20 26.4 +41.5	93.4	20 22.7 +42.2	93.7	20 18.6 +43.0	94.1	20 14.1 +43.8	94.5	12
13	21 07.9 +41.2	92.6	21 04.9 +42.1	93.0	21 01.6 +42.8	93.4	20 57.9 +43.6	93.8	20 53.7 +44.4	94.1	20 49.2 +45.1	94.5	20 44.3 +45.8	94.9	20 39.0 +46.5	95.3	13	21 07.9 +41.2	92.6	21 04.9 +42.1	93.0	21 01.6 +42.8	93.4	20 57.9 +43.6	93.8	13
14	21 49.1 +41.0	91.8	21 47.0 +41.8	92.2	21 44.4 +42.7	92.6	21 41.5 +43.4	93.0	21 38.1 +44.2	93.4	21 34.3 +45.0	93.8	21 30.1 +45.7	94.2	21 25.5 +46.4	94.6	14	21 49.1 +41.0	91.8	21 47.0 +41.8	92.2	21 44.4 +42.7	92.6	21 41.5 +43.4	93.0	14
15	22 30.1 +40.7	91.0	22 28.8 +41.6	91.4	22 27.1 +42.4	91.9	22 24.9 +43.2	92.3	22 22.3 +44.0	92.7	22 19.3 +44.7	93.1	22 15.8 +45.5	93.5	22 11.9 +46.2	93.9	15	22 30.1 +40.7	91.0	22 28.8 +41.6	91.4	22 27.1 +42.4	91.9	22 24.9 +43.2	92.3	15
16	23 10.8 +40.6	90.2	23 10.4 +41.3	90.7	23 09.5 +42.1	91.1	23 08.1 +43.0	91.5	23 06.3 +43.7	91.9	23 04.0 +44.5	92.4	23 01.3 +45.3	92.8	22 58.1 +46.1	93.2	16	23 10.8 +40.6	90.2	23 10.4 +41.3	90.7	23 09.5 +42.1	91.1	23 08.1 +43.0	91.5	16
17	23 51.4 +40.2	89.4	23 51.7 +41.1	89.9	23 51.6 +42.0	90.3	23 51.1 +42.7	90.8	23 50.0 +43.6	91.2	23 48.5 +44.4	91.6	23 46.6 +45.1	92.1	23 44.2 +45.8	92.5	17	23 51.4 +40.2	89.4	23 51.7 +41.1	89.9	23 51.6 +42.0	90.3	23 51.1 +42.7	90.8	17
18	24 31.6 +40.0	88.6	24 32.8 +40.9	89.1	24 33.6 +41.7	89.5	24 33.8 +42.5	90.0	24 33.6 +43.3	90.4	24 32.9 +44.1	90.9	24 31.7 +44.9	91.4	24 30.0 +45.7	91.8	18	24 31.6 +40.0	88.6	24 32.8 +40.9	89.1	24 33.6 +41.7	89.5	24 33.8 +42.5	90.0	18
19	25 11.6 +39.8	87.8	25 13.7 +40.6	88.3	25 15.3 +41.4	88.7	25 16.3 +42.3	89.2	25 16.9 +43.1	89.7	25 17.0 +43.9	90.2	25 16.6 +44.7	90.6	25 15.7 +45.4	91.1	19	25 11.6 +39.8	87.8	25 13.7 +40.6	88.3	25 15.3 +41.4	88.7	25 16.3 +42.3	89.2	19
20	25 51.4 +39.4	87.0	25 54.3 +40.3	87.5	25 56.7 +41.2	88.0	25 58.6 +42.0	88.4	25 58.0 +42.8	88.8	25 56.0 +43.6	89.4	25 50.9 +44.3	89.9	25 46.1 +44.4	90.4	20	25 51.4 +39.4	87.0	25 54.3 +40.3	87.5	25 56.7 +41.2	88.0	25 58.6 +42.0	88.4	20
21	26 30.8 +39.2	86.1	26 34.6 +40.0	86.6	26 37.9 +40.9	87.1	26 40.6 +41.8	87.6	26 42.8 +42.6	88.1	26 44.5 +43.4	88.6	26 45.7 +44.2	89.1	26 46.3 +45.0	89.6	21	26 30.8 +39.2	86.1	26 34.6 +40.0	86.6	26 37.9 +40.9	87.1	26 40.6 +41.8	87.6	21
22	27 10.0 +38.8	85.3	27 14.6 +39.8	85.8	27 18.8 +40.6	86.3	27 22.4 +41.4	86.8	27 25.4 +42.3	87.3	27 27.9 +43.9	88.4	27 30.1 +44.8	88.9	27 31.3 +44.8	88.9	22	27 10.0 +38.8	85.3	27 14.6 +39.8	85.8	27 18.8 +40.6	86.3	27 22.4 +41.4	86.8	22
23	27 48.8 +38.5	84.4	27 54.4 +39.4	84.9	27 59.4 +40.3	85.5	28 03.8 +41.2	86.0	28 07.7 +42.0	86.5	28 11.1 +42.8	87.1	28 13.8 +43.7	87.6	28 16.1 +44.5	88.1	23	27 48.8 +38.5	84.4	27 54.4 +39.4	84.9	27 59.4 +40.3	85.5	28 03.8 +41.2	86.0	23
24	28 27.3 +38.2	83.6	28 33.8 +38.1	84.1	28 39.7 +39.4	84.6	28 45.0 +40.8	85.2	28 49.7 +41.8	85.7	28 53.9 +42.4	86.3	28 57.5 +43.4	87.4	28 61.2 +44.2	88.7	24	28 27.3 +38.2	83.6	28 33.8 +38.1	84.1	28 39.7 +39.4	84.6	28 45.0 +40.8	85.2	24
25	29 05.5 +37.8	82.7	29 12.9 +38.7	83.2	29 19.6 +39.7	83.8	29 25.8 +40.6	84.3	29 31.5 +41.4	84.9	29 36.5 +42.3	85.5	29 40.9 +43.2	86.0	29 44.8 +44.0	86.6	25	29 05.5 +37.8	82.7	29 12.9 +38.7	83.2	29 19.6 +39.7	83.8	29 25.8 +40.6	84.3	25
26	29 43.3 +37.5	81.8	29 51.6 +38.4	82.3	29 59.3 +39.3	82.9	30 06.4 +40.2	83.5	30 12.9 +41.1	84.1	30 18.8 +42.0	84.7	30 24.1 +42.8	85.2	30 28.8 +43.6	85.8	26	29 43.3 +37.5	81.8	29 51.6 +38.4	82.3	29 59.3 +39.3	82.9	30 06.4 +40.2	83.5	26
27	30 20.8 +37.1	80.9	30 30.0 +38.0	81.5	30 38.6 +38.9	82.0	30 46.6 +39.9	82.6	30 54.0 +40.7	83.2	31 00.8 +41.6	83.8	31 06.9 +42.5	84.4	31 12.4 +43.4	85.0	27	30 20.8 +37.1	80.9	30 30.0 +38.0	81.5	30 38.6 +38.9	82.0	30 46.6 +39.9	82.6	27
28	30 57.9 +36.7	80.0	31 08.0 +37.7	80.6	31 17.5 +38.6	81.2	31 26.5 +39.5	81.8	31 34.7 +40.5	82.4	31 42.4 +41.3	83.0	31 49.4 +42.2	83.6	31 55.8 +43.0	84.2	28	30 57.9 +36.7	80.0	31						

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 73° , 287°

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			Dec.								
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z									
0	11	55.9	-43.4	102.2	11	43.1	-44.1	102.4	11	30.1	-44.8	102.6	11	16.9	-45.5	102.8	11	03.5	-46.2	103.0	10	49.9	-46.8	103.2	10	36.2	-47.5	103.4	10	22.2	-48.1	103.5	0
1	11	12.5	-43.6	102.9	10	59.0	-44.3	103.1	10	45.3	-44.9	103.3	10	31.4	-45.6	103.5	10	17.3	-46.2	103.6	10	03.1	-46.9	103.8	9	48.7	-47.6	104.0	9	34.1	-48.2	104.2	1
2	10	28.9	-43.6	103.6	10	14.7	-44.3	103.8	10	00.4	-45.0	104.0	9	45.8	-45.7	104.1	9	31.1	-46.3	104.3	9	16.2	-47.0	104.4	9	01.1	-47.6	104.6	8	45.9	-48.2	104.8	3
3	9	45.3	-43.6	104.3	9	30.4	-44.4	104.5	9	15.4	-45.1	104.6	9	00.1	-45.7	104.8	8	44.8	-46.4	104.9	8	29.2	-47.0	105.1	8	13.5	-47.6	105.2	7	57.7	-48.3	105.4	4
4	9	01.7	-43.8	105.0	8	46.0	-44.4	105.1	8	30.3	-45.1	105.3	8	14.4	-45.8	105.4	7	58.4	-46.5	105.6	7	42.2	-47.1	105.7	7	25.9	-47.7	105.8	7	09.4	-48.3	106.0	4
5	8	17.9	-43.9	105.7	8	01.6	-44.5	105.8	7	45.2	-45.2	106.0	7	28.6	-45.9	106.1	7	11.9	-46.5	106.2	6	55.1	-47.1	106.3	6	38.2	-47.8	106.4	6	21.1	-48.3	106.6	5
6	7	34.0	-43.9	106.4	7	17.1	-44.6	106.5	7	0.0	-45.3	106.6	6	42.7	-45.9	106.7	6	25.4	-46.6	106.8	6	0.8	-47.2	107.0	5	50.4	-47.8	107.1	6	32.8	-48.4	107.1	6
7	6	50.1	-43.9	107.1	6	32.5	-44.7	107.2	6	14.7	-45.3	107.3	5	56.8	-45.9	107.4	5	38.8	-46.5	107.5	5	20.8	-47.2	107.6	5	52.6	-47.8	107.7	7	44.4	-48.5	107.7	7
8	6	06.2	-44.0	107.7	5	47.8	-44.7	107.8	5	29.4	-45.3	107.9	5	10.9	-46.0	108.0	4	52.3	-46.7	108.1	4	33.6	-47.3	108.2	3	26.9	-47.8	108.3	8	35.9	-48.4	108.3	8
9	5	22.2	-44.1	108.4	5	03.1	-44.7	108.5	4	44.1	-45.4	108.6	4	24.9	-46.1	108.7	4	05.6	-46.6	108.7	3	46.3	-47.3	108.8	3	07.5	-48.5	108.9	9				
10	4	38.1	-44.1	109.1	4	18.4	-44.7	109.2	3	58.7	-45.4	109.3	3	38.8	-46.0	109.3	3	19.0	-46.7	109.4	2	59.0	-47.3	109.4	2	19.0	-48.5	109.5	10				
11	3	54.0	-44.1	109.8	3	33.7	-44.8	109.9	3	13.3	-45.5	109.9	2	52.8	-46.1	110.0	2	32.3	-46.7	110.0	1	51.2	-48.0	110.1	1	30.5	-48.4	110.1	11				
12	3	09.9	-44.2	110.5	2	48.9	-44.9	110.5	2	27.8	-45.6	110.6	1	06.7	-46.1	110.6	1	45.6	-46.7	110.6	1	14.4	-47.3	110.7	0	42.1	-48.5	110.7	12				
13	2	25.7	-44.2	111.2	2	04.0	-44.8	111.2	1	42.3	-45.4	111.2	1	20.6	-46.1	111.2	0	58.9	-46.7	111.3	0	15.3	-47.9	111.3	0	06.4	+48.5	111.3	13				
14	1	41.5	-44.2	111.8	1	19.2	-44.8	111.9	0	56.9	-45.5	111.9	0	34.5	-46.1	111.9	0	12.2	-46.8	111.9	0	10.2	+47.3	112.1	0	32.6	+47.9	112.1	14				
15	0	57.3	-44.2	112.5	0	34.4	-44.9	112.5	0	11.4	-45.5	112.5	0	11.6	+46.1	112.5	0	34.6	+46.7	112.5	0	57.5	+47.4	112.5	15	1	+43.4	+48.5	112.5	15			
16	0	13.1	-44.2	113.2	0	10.5	+44.8	116.8	0	34.1	+45.5	116.8	0	57.7	+46.1	116.8	0	21.3	+46.7	116.9	1	44.9	+47.3	116.9	2	31.9	+48.5	116.9	16				
17	0	31.1	+44.2	66.1	0	55.3	+44.9	66.2	1	19.6	+44.5	66.2	1	43.8	+46.1	66.2	2	08.0	+46.7	66.2	2	32.2	+47.3	66.3	2	56.3	+47.9	66.3	3	20.4	+48.4	66.4	17
18	1	15.3	+44.1	65.5	1	40.2	+44.8	65.5	2	05.0	+45.5	65.5	2	29.9	+46.0	65.6	2	54.7	+46.7	65.6	3	19.5	+47.2	65.6	3	44.2	+48.4	65.6	18				
19	1	59.4	+44.2	64.8	2	25.0	+44.8	64.8	2	50.5	+45.4	64.9	3	15.9	+46.1	64.9	3	41.4	+46.6	65.0	4	06.7	+47.3	65.0	4	57.2	+48.4	65.2	19				
20	2	43.6	+44.2	64.1	3	09.8	+44.8	64.2	3	35.9	+45.4	64.2	4	02.0	+46.0	64.3	4	28.0	+46.8	64.3	4	54.0	+47.2	64.4	5	19.8	+47.8	64.5	20				
21	3	27.8	+44.1	63.4	3	54.6	+44.7	63.5	4	21.3	+45.4	63.6	4	48.0	+46.0	63.6	5	14.6	+46.6	63.7	5	41.2	+47.1	63.8	6	07.6	+47.7	63.9	21				
22	4	11.9	+44.1	62.8	4	39.3	+44.7	62.8	5	06.7	+45.3	62.9	5	34.0	+45.9	63.0	6	01.2	+46.5	63.1	6	28.3	+47.1	63.2	6	55.3	+47.7	63.3	22				
23	5	46.0	+44.0	62.1	5	24.0	+44.7	62.2	5	52.0	+45.3	62.2	6	19.9	+45.9	62.3	6	47.7	+46.5	62.4	7	15.4	+47.1	62.5	7	43.0	+47.7	62.6	23				
24	5	40.0	+44.0	61.4	6	08.7	+44.8	61.5	6	37.3	+45.2	61.6	7	34.2	+46.4	61.8	8	02.5	+47.0	61.9	8	30.7	+47.6	62.0	8	58.7	+48.2	62.2	24				
25	6	24.0	+43.9	60.7	6	53.3	+44.6	60.8	7	22.5	+45.2	60.9	7	51.6	+45.8	61.0	8	20.6	+46.4	61.2	8	49.5	+47.0	61.3	9	18.3	+47.5	61.4	25				
26	7	07.9	+43.9	60.0	7	37.9	+44.5	60.1	8	07.7	+45.1	60.3	8	37.4	+45.7	60.4	9	07.0	+46.3	60.5	9	36.5	+46.8	60.7	10	05.8	+47.4	60.8	10				
27	7	51.8	+43.8	59.3	8	22.4	+44.8	59.5	8	52.8	+45.0	59.6	9	23.1	+45.6	59.7	9	53.3	+46.2	59.9	10	23.3	+46.8	60.0	10	53.2	+47.4	60.2	27				
28	8	35.6	+43.8	58.6	9	06.8	+44.3	58.8	9	37.8	+45.0	58.9	10	08.7	+45.6	59.1	10	39.5	+46.1	59.2	11	10.1	+46.8	59.4	11	40.6	+47.3	59.6	28				
29	9	19.4	+43.6	58.0	9	51.1	+44.3	58.1	10	22.8	+44.9	58.2	10	54.3	+45.5	58.4	11	25.6	+46.1	58.6	12	27.9	+47.2	58.8	12	58.8	+47.7	59.1	29				
30	10	03.0	+43.6	57.3	10	35.4	+44.2	57.4	11	07.7	+44.7	57.6	11	39.8	+45.3	57.7	12	11.7	+46.0	57.9	12	43.5	+46.5	58.1	13	15.1	+47.1	58.3	30				
31	10	46.6	+43.5	56.6	11	19.6	+44.1	56.7	11	52.4	+44.7	56.9	12	25.1	+45.3	57.1	12	57.7	+45.8	57.3	13	30.0	+46.5	57.5	14	02.2	+47.0	57.7	31				
32	11	30.1	+43.5	55.9	12	03.7	+43.9	56.0	13	27.3	+44.1	56.2	13	10.4	+45.2	56.4	13	43.5	+45.8	56.6	14	49.2	+46.9	56.8	15	21.8	+47.4	57.3	32				
33	12	13.4	+43.3	55.1	12	47.6	+43.9	55.3	13	21.7	+44.5	55.5	13	55.6	+45.7	55.7	14	29.3	+46.2	56.1	15	36.1	+46.8	56.4	16	09.2	+47.4	56.6	33				
34	12	24.6	+41.1	54.5	22	06.5	+41.7	54.8	22	48.2	+42.3	54.1	23	29.7	+42.9	54.4	24	11.0	+43.4	54.6	24	52.0	+44.0	54.7	25	32.7	+44.6	54.7	46				
35	13	22.0	+40.7	54.7	22	30.5	+42.1	54.5	23	30.5	+42.6	54.6	24	12.6	+42.6	54.7	25	54.4	+43.2	54.7	26	17.3	+44.3	54.7	27	23.2	+45.4	54.7	47				
36	14	21.6	+40.7	54.0	23	29.7	+41.3	54.2	24	12.6	+41.8	54.4	25	37.6	+43.0	54.5	26	19.8	+43.5	54.6	27	01.6	+44.2	54.7	28	17.6	+44.8	54.7					

74°, 286° L.H.A.

LATITUDE SAME NAME AS DECLINATION

L.H.A. greater than 180°Zn=Z
N. Lat. { L.H.A. less than 180°Zn=360°-Z

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			Dec.																																																																																																																																																																																																																																																																																																																																																					
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z																																																																																																																																																																																																																																																																																																																																																						
0	11 14.4 +43.2	101.5	11 02.3 +44.0	101.7	10 50.1 +44.6	101.8	10 37.7 +45.3	102.0	10 25.1 +46.0	102.2	10 12.3 +46.7	102.4	9 59.4 +47.3	102.6	9 46.2 +48.0	102.7	0	11 15.6 +43.1	100.8	11 46.3 +43.8	101.0	11 34.7 +44.6	101.2	11 23.0 +45.3	101.4	11 11.1 +45.9	101.6	10 59.0 +46.6	101.7	10 46.7 +47.2	101.9	10 34.2 +47.8	102.1	1																																																																																																																																																																																																																																																																																																																																												
1	11 57.6 +43.1	100.8	11 46.3 +43.8	101.0	11 34.7 +44.6	101.2	11 23.0 +45.3	101.4	11 11.1 +45.9	101.6	10 59.0 +46.6	101.7	10 46.7 +47.2	101.9	10 34.2 +47.8	102.1	1	12 40.7 +42.9	100.0	12 30.1 +43.7	100.3	12 19.3 +44.4	100.5	12 08.3 +45.1	100.7	11 57.0 +45.8	100.9	11 45.6 +46.5	101.1	11 33.9 +47.2	101.3	11 22.0 +47.8	101.5	2																																																																																																																																																																																																																																																																																																																																												
2	13 23.6 +42.9	99.3	13 13.8 +43.6	99.6	13 03.7 +44.3	99.8	12 53.4 +45.0	100.0	12 42.8 +45.8	100.2	12 32.1 +46.4	100.5	12 21.1 +47.0	100.7	12 09.8 +47.7	100.9	12 57.5 +47.7	100.3	3	14 06.5 +42.7	98.6	13 57.4 +43.5	98.9	13 48.0 +44.2	99.1	13 38.4 +44.9	99.3	13 18.5 +46.1	99.6	13 08.1 +47.0	100.0	12 57.5 +47.7	100.3	4																																																																																																																																																																																																																																																																																																																																												
5	14 49.2 +42.6	97.9	14 40.9 +43.3	98.1	14 32.2 +44.1	98.4	14 23.3 +44.8	98.7	14 14.2 +45.5	98.9	14 04.8 +46.2	99.2	13 55.1 +46.9	99.4	13 45.2 +47.5	99.6	5	15 31.8 +42.5	97.2	15 24.2 +43.2	97.4	15 16.3 +44.0	97.7	15 08.1 +44.7	98.0	14 59.7 +45.4	98.2	14 51.0 +46.0	98.5	14 42.0 +46.7	98.8	14 32.7 +47.4	99.0	6																																																																																																																																																																																																																																																																																																																																												
6	16 14.3 +42.3	96.4	16 07.4 +43.1	96.7	16 00.3 +43.8	97.0	15 52.8 +44.6	97.3	15 45.1 +45.2	97.6	15 37.0 +46.0	97.8	15 28.7 +46.7	98.1	15 20.1 +47.3	98.4	7	16 56.6 +42.1	95.7	16 50.5 +42.9	96.0	16 44.1 +43.6	96.3	16 37.4 +44.4	96.6	16 30.3 +45.2	96.9	16 23.0 +45.8	97.2	16 15.4 +46.5	97.5	16 07.4 +47.2	97.7	8																																																																																																																																																																																																																																																																																																																																												
9	17 38.7 +42.0	94.9	17 33.4 +42.7	95.2	17 27.7 +43.5	95.6	17 21.8 +44.2	95.9	17 15.5 +44.9	96.2	17 08.8 +45.7	96.5	17 01.9 +46.4	96.8	16 54.6 +47.1	97.1	9	18 20.7 +41.8	94.2	18 16.1 +42.6	94.5	18 11.2 +43.4	94.9	18 06.0 +44.1	95.2	17 54.5 +45.6	95.8	17 48.3 +46.3	96.1	17 41.7 +47.0	96.4	10	19 02.5 +41.6	93.4	18 58.7 +42.4	93.8	18 54.6 +43.2	94.1	18 50.1 +43.9	94.4	18 45.3 +44.7	94.8	18 40.1 +45.4	95.1	18 34.6 +46.1	95.5	18 28.7 +46.8	95.8	11																																																																																																																																																																																																																																																																																																																													
12	19 44.1 +41.4	92.7	19 41.1 +42.2	93.0	19 37.8 +42.9	93.4	19 34.0 +43.8	93.7	19 30.0 +44.5	94.1	19 25.5 +45.3	94.4	19 20.7 +46.0	94.6	19 15.5 +46.7	95.1	12	20 25.5 +41.2	91.9	20 23.3 +42.0	92.3	20 20.7 +42.8	92.6	20 17.8 +43.6	93.0	20 14.5 +44.3	93.4	20 10.8 +45.0	93.7	20 06.7 +45.8	94.1	20 02.2 +46.5	94.5	13																																																																																																																																																																																																																																																																																																																																												
14	21 06.7 +41.0	91.1	21 05.3 +41.8	91.5	21 03.5 +42.6	91.9	21 01.4 +43.4	92.3	20 58.8 +44.2	92.6	20 55.8 +44.9	93.0	20 52.5 +45.6	93.4	20 48.7 +46.4	93.8	20	21 47.7 +40.7	90.3	21 47.1 +41.6	90.7	21 46.1 +42.4	91.1	21 43.0 +43.9	91.9	21 40.7 +44.8	92.3	21 38.1 +45.5	92.7	21 35.1 +46.1	93.1	21	22 28.4 +40.6	89.5	22 28.7 +41.4	89.9	22 28.5 +42.0	90.4	22 27.9 +43.0	90.8	22 26.9 +43.8	91.2	22 25.5 +44.5	91.6	22 23.6 +45.3	92.0	22 21.2 +46.1	92.4	16																																																																																																																																																																																																																																																																																																																													
17	23 09.0 +40.2	88.7	23 10.1 +41.1	89.2	23 10.7 +42.0	89.6	23 10.9 +42.8	90.0	23 10.7 +43.5	90.4	23 10.4 +43.9	90.9	23 08.9 +45.0	91.3	23 07.3 +45.8	91.7	23	24 49.2 +40.1	87.9	24 51.2 +40.9	88.4	24 53.7 +41.7	88.8	24 54.3 +42.5	89.3	24 53.4 +44.1	90.1	24 53.9 +44.9	90.6	24 53.1 +45.6	91.0	24 39.3 +39.7	90.3	24	25 09.0 +39.5	86.3	25 12.7 +40.3	86.8	25 15.6 +41.2	87.2	25 18.5 +42.0	87.7	25 22.3 +43.2	88.6	25 23.5 +44.4	89.1	25 24.2 +45.2	89.6	25	26 48.5 +39.2	85.4	26 53.0 +40.1	85.9	26 57.0 +40.9	86.4	26 50.5 +41.8	86.9	26 03.5 +42.6	87.4	26 06.0 +43.4	87.9	26 07.9 +44.3	88.4	26 09.4 +45.0	88.9	21																																																																																																																																																																																																																																																																																																												
24	27 45.2 +38.2	82.9	27 52.3 +39.2	83.4	27 58.9 +40.1	83.9	28 10.5 +40.0	84.5	28 15.5 +42.4	85.5	28 19.8 +43.5	86.1	28 3.1 +41.4	87.4	29 01.4 +41.8	91.5	29 03.5 +42.6	92.3	29 06.8 +43.4	92.9	29 10.4 +44.2	93.2	29 14.0 +45.0	93.7	29 18.7 +45.8	94.2	29 23.7 +46.4	94.6	29 28.7 +47.0	95.1	29	30 21.4 +37.2	80.2	29 48.8 +38.1	80.8	29 58.1 +39.1	81.4	30 06.8 +40.0	81.9	30 14.9 +40.9	82.5	30 22.4 +41.8	83.1	30 29.3 +42.6	83.7	30 35.6 +43.5	84.3	30	31 29.4 +37.2	79.1	31 15.6 +38.4	79.6	31 26.4 +39.2	80.2	31 36.3 +40.1	80.8	31 45.5 +41.1	81.4	31 54.2 +41.9	82.0	32 02.2 +42.8	82.6	32	33 27.7 +37.2	78.4	33 10.4 +37.4	79.0	33 15.2 +38.4	79.7	33 23.7 +39.2	80.3	33 32.7 +40.1	81.1	33 41.1 +41.7	81.7	33 49.1 +43.1	83.5	33	36 10.1 +37.2	78.0	36 26.9 +38.6	80.4	36 40.4 +40.5	81.7	36 55.8 +40.5	82.1	37 01.4 +42.1	82.3	37 11.9 +42.3	82.9	37 19.1 +43.3	83.5	37 27.4 +42.2	84.1	37	38 16.1 +36.9	79.3	38 26.9 +37.8	79.9	38 30.7 +38.6	80.3	38 37.4 +39.4	81.7	38 44.9 +40.4	82.6	38 51.9 +41.4	83.2	39 57.7 +42.2	84.0	39 53.2 +42.8	84.7	39 57.8 +43.7	85.3	39 57.8 +44.7	86.1	39 57.8 +45.7	87.7	39 57.8 +46.7	88.7	39 57.8 +47.7	89.7	39 57.8 +48.7	90.7	39 57.8 +49.7	91.7	39 57.8 +50.7	92.7	39 57.8 +51.7	93.7	39 57.8 +52.7	94.7	39 57.8 +53.7	95.7	39 57.8 +54.7	96.7	39 57.8 +55.7	97.7	39 57.8 +56.7	98.7	39 57.8 +57.7	99.7	39 57.8 +58.7	100.7	39 57.8 +59.7	101.7	39 57.8 +60.7	102.7	39 57.8 +61.7	103.7	39 57.8 +62.7	104.7	39 57.8 +63.7	105.7	39 57.8 +64.7	106.7	39 57.8 +65.7	107.7	39 57.8 +66.7	108.7	39 57.8 +67.7	109.7	39 57.8 +68.7	110.7	39 57.8 +69.7	111.7	39 57.8 +70.7	112.7	39 57.8 +71.7	113.7	39 57.8 +72.7	114.7	39 57.8 +73.7	115.7	39 57.8 +74.7	116.7	39 57.8 +75.7	117.7	39 57.8 +76.7	118.7	39 57.8 +77.7	119.7	39 57.8 +78.7	120.7	39 57.8 +79.7	121.7	39 57.8 +80.7	122.7	39 57.8 +81.7	123.7	39 57.8 +82.7	124.7	39 57.8 +83.7	125.7	39 57.8 +84.7	126.7	39 57.8 +85.7	127.7	39 57.8 +86.7	128.7	39 57.8 +87.7	129.7	39 57.8 +88.7	130.7	39 57.8 +89.7	131.7	39 57.8 +90.7	132.7	39 57.8 +91.7	133.7	39 57.8 +92.7	134.7	39 57.8 +93.7	135.7	39 57.8 +94.7	136.7	39 57.8 +95.7	137.7	39 57.8 +96.7	138.7	39 57.8 +97.7	139.7	39 57.8 +98.7	140.7	39 57.8 +99.7	141.7	39 57.8 +100.7	142.7	39 57.8 +101.7	143.7	39 57.8 +102.7	144.7	39 57.8 +103.7	145.7	39 57.8 +104.7	146.7	39 57.8 +105.7	147.7	39 57.8 +106.7	148.7	39 57.8 +107.7	149.7	39 57.8 +108.7	150.7	39 57.8 +109.7	151.7	39 57.8 +110.7	152.7	39 57.8 +111.7	153.7	39 57.8 +112.7	154.7	39 57.8 +113.7	155.7	39 57.8 +114.7	156.7	39 57.8 +115.7	157.7	39 57.8 +116.7	158.7	39 57.8 +117.7	159.7	39 57.8 +118.7	160.7	39 57.8 +119.7	161.7	39 57.8 +120.7	162.7	39 57.8 +121.7	163.7	39 57.8 +122.7	164.7	39 57.8 +123.7	165.7	39 57.8 +124.7	166.7	39 57.8 +125.7	167.7	39 57.8 +126.7	168.7	39 57.8 +127.7	169.7	39 57.8 +128.7	170.7	39 57.8 +129.7	171.7	39 57.8 +130.7	172.7	39 57.8 +131.7	173.7	39 57.8 +132.7	174.7	39 57.8 +133.7	175.7	39 57.8 +134.7	176.7	39 57.8 +135.7	177.7	39 57.8 +136.7	178.7	39 57.8 +137.7	179.7	39 57.8 +138.7	180.7	39 57.8 +139.7	181.7	39 57.8 +140.7	182.7	39 57.8 +141.7	183.7	39 57.8 +142.7	184.7	39 57.8 +143.7	185.7	39 57.8 +144.7	186.7	39 57.8 +145.7	187.7	39 57.8 +146.7	188.7	39 57.8 +147.7	189.7	39 57.8 +148.7	190.7	39 57.8 +149.7	191.7	39 57.8 +150.7	192.7	39 57.8 +151.7	193.7	39 57.8 +152.7	194.7	39 57.8 +153.7	195.7	39 57.8 +154.7	196.7	39 57.8 +155.7	197.7	39 57.8 +156.7	198.7	39 57.8 +157.7	199.7	39 57.8 +158.7	200.7	39 57.8 +159.7	201.7	39 57.8 +160.7	202.7	39 57.8 +161.7	203.7	39 57.8 +162.7	204.7	39 57.8 +163.7	205.7	39 57.8 +164.7	206.7	39 57.8 +165.7	207.7	39 57.8 +166.7	208.7	39 57.8 +167.7	209.7	39 57.8 +168.7	210.7	39 57.8 +169.7	211.7	39 57.8 +17

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 74° , 286°

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			Dec.	
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z		
0	11 14.4 -43.4	101.5	11 02.3 -44.0	101.7	10 50.1 -44.7	101.8	10 37.7 -45.4	102.0	10 25.1 -46.1	102.2	10 12.3 -46.7	102.4	9 59.4 -47.4	102.6	9 46.2 -48.0	102.7	9 0									
1	10 31.0 -43.4	102.2	10 18.3 -44.1	102.3	10 05.4 -44.8	102.5	9 52.3 -45.5	102.7	9 39.0 -46.1	102.9	9 25.6 -46.8	103.0	9 12.0 -47.5	103.2	8 58.2 -48.1	103.3	8 1									
2	9 47.6 -43.4	102.9	9 34.2 -44.2	103.0	9 20.6 -44.9	103.2	9 06.8 -45.6	103.4	8 52.9 -46.3	103.5	8 38.8 -46.9	103.7	8 24.5 -47.5	103.8	8 10.1 -48.1	103.9	8 3									
3	9 04.2 -43.6	103.6	8 50.0 -44.3	103.7	8 35.7 -44.9	103.9	8 21.2 -45.6	104.0	8 06.6 -46.2	104.2	7 51.9 -46.9	104.3	7 37.0 -47.5	104.4	7 22.0 -48.1	104.5	7 4									
4	8 20.6 -43.6	104.3	8 05.7 -44.3	104.4	7 50.8 -45.1	104.5	7 35.6 -45.7	104.7	7 20.4 -46.4	104.8	7 05.0 -47.0	104.9	6 49.5 -47.6	105.0	6 33.9 -48.3	105.1	6 4									
5	7 37.0 -43.7	105.0	7 21.4 -44.4	105.1	7 05.7 -45.0	105.2	6 49.9 -45.7	105.3	6 34.0 -46.3	105.4	6 18.0 -47.0	105.5	6 01.9 -47.7	105.6	5 45.6 -48.2	105.7	5 5									
6	6 53.3 -43.8	105.6	6 37.0 -44.4	105.8	6 20.7 -45.1	105.9	6 04.2 -45.8	106.0	5 47.7 -46.5	106.1	5 31.0 -47.1	106.2	4 26.6 -47.7	106.8	4 09.1 -48.3	106.9	4 6									
7	6 09.5 -43.8	106.3	5 52.6 -44.5	106.4	5 35.6 -45.2	106.5	5 18.4 -45.8	106.6	5 01.2 -46.4	106.7	4 43.9 -47.1	106.8	3 38.9 -47.8	107.5	3 20.8 -48.3	107.5	3 8									
8	5 25.7 -43.9	107.0	5 08.1 -44.6	107.1	4 50.4 -45.2	107.2	4 32.6 -45.8	107.3	4 14.8 -46.5	107.3	3 28.3 -46.6	108.0	3 09.7 -47.1	108.0	2 51.1 -47.7	108.1	2 32.5 -48.4	108.1	2 9							
9	4 41.8 -43.9	107.7	4 23.5 -44.5	107.8	4 05.2 -45.3	107.9	3 46.8 -45.9	107.9	3 00.9 -45.9	108.6	2 41.7 -46.5	108.6	2 22.6 -47.2	108.7	2 03.4 -47.8	108.7	1 44.1 -48.3	108.7	1 10							
10	3 57.9 -43.9	108.4	3 39.0 -44.6	108.5	3 19.9 -45.2	108.5	3 00.9 -45.9	108.6	2 41.7 -46.5	108.6	2 22.6 -47.2	108.7	2 03.4 -47.8	108.7	1 44.1 -48.3	108.7	1 11									
11	3 14.0 -44.0	109.1	2 54.4 -44.7	109.1	2 34.7 -45.3	109.2	2 15.0 -46.0	109.2	1 55.2 -46.5	109.2	1 35.4 -47.1	109.3	1 15.6 -47.8	109.3	0 55.8 -48.4	109.3	0 11									
12	2 30.0 -43.9	109.8	2 09.7 -44.6	109.8	1 49.4 -45.3	109.8	1 39.0 -45.9	109.9	1 08.7 -46.6	109.9	0 48.3 -47.2	109.9	0 27.8 -47.7	109.9	0 07.4 -48.4	109.9	0 12									
13	1 46.1 -44.0	110.4	1 25.1 -44.7	110.5	1 04.1 -45.3	110.5	0 43.1 -45.9	110.5	0 22.1 -46.6	110.5	0 0.1 -47.2	110.5	0 19.9 +47.8	69.5	0 41.0 +48.3	69.5	0 13									
14	1 02.1 -44.0	111.1	0 40.4 -44.6	111.1	0 18.8 -45.3	111.1	0 0.2 +46.0	68.9	0 24.5 +46.5	68.9	0 46.1 +47.2	68.9	0 1.7 +47.8	68.9	1 29.3 +48.4	68.9	1 14									
15	0 18.1 -44.1	111.8	0 0.4 +44.7	68.2	0 26.5 +45.3	68.2	0 48.9 +44.8	67.5	1 11.8 +45.3	67.6	1 34.7 +45.9	67.6	2 20.4 +47.2	67.6	1 55.5 +47.7	68.3	2 17.7 +48.3	68.3	1 15							
16	0 26.0 +44.0	67.5	0 48.9 +44.8	67.5	1 11.8 +45.3	67.6	1 34.7 +45.9	67.6	2 20.4 +47.2	67.6	2 43.2 +47.8	67.7	3 06.0 +48.3	67.7	1 55.5 +47.7	68.3	2 17.7 +48.3	68.3	1 16							
17	1 10.0 +44.0	66.8	1 33.5 +44.7	66.9	1 57.1 +45.3	66.9	2 20.6 +45.9	66.9	2 44.1 +46.5	67.0	3 07.6 +47.1	67.0	3 31.0 +47.7	67.1	3 54.3 +48.3	67.1	3 17									
18	1 54.0 +43.9	66.2	2 18.2 +44.6	66.2	2 42.4 +45.2	66.2	3 06.5 +45.9	66.3	3 30.6 +46.5	66.3	3 54.7 +47.1	66.4	4 18.7 +47.7	66.5	4 42.6 +48.3	66.5	4 18									
19	2 37.9 +44.0	65.5	3 02.8 +44.6	65.5	3 27.6 +45.3	65.6	3 52.4 +45.9	65.6	4 17.1 +46.5	65.7	4 41.8 +47.0	65.8	5 06.4 +47.6	65.9	5 30.9 +48.2	65.9	5 19									
20	3 21.9 +43.9	64.8	3 47.4 +44.6	64.9	4 12.9 +45.2	64.9	4 38.3 +45.8	65.0	5 03.6 +46.4	65.1	5 28.8 +47.1	65.2	5 54.0 +47.6	65.2	6 19.1 +48.2	65.3	6 20									
21	4 05.8 +43.9	64.1	4 32.0 +44.6	64.2	4 58.1 +45.1	64.3	5 24.1 +45.8	64.3	5 50.0 +46.4	64.4	6 15.9 +46.9	64.5	6 41.6 +47.6	64.6	7 07.3 +48.1	64.7	7 21									
22	4 49.7 +43.9	63.4	5 16.5 +44.5	63.5	5 43.2 +45.1	63.6	6 09.9 +45.7	63.7	6 36.4 +46.3	63.8	7 02.8 +47.0	63.9	7 29.2 +47.5	64.0	7 55.4 +48.1	64.1	7 22									
23	5 33.6 +43.8	62.8	6 01.0 +44.4	62.8	6 28.3 +45.1	62.9	6 55.6 +45.7	63.0	7 22.7 +46.3	63.2	7 49.8 +46.8	63.3	8 16.7 +47.4	63.4	8 43.5 +48.0	63.5	8 23									
24	6 17.4 +43.7	62.1	6 45.4 +44.4	62.2	7 13.4 +45.0	62.3	8 41.3 +45.6	62.4	8 09.0 +46.2	62.5	8 36.6 +46.9	62.6	9 04.1 +47.4	62.8	9 31.5 +48.0	62.9	9 24									
25	7 01.1 +43.7	61.4	7 29.8 +44.3	61.5	7 58.4 +44.9	61.6	8 26.9 +45.5	61.7	8 55.2 +46.2	61.9	9 23.5 +46.7	62.0	9 51.5 +47.4	62.2	10 19.5 +47.9	62.3	10 25									
26	7 44.8 +43.6	60.7	8 14.1 +44.3	60.8	8 43.3 +44.9	60.9	9 12.4 +45.5	61.1	9 41.4 +46.1	61.2	10 10.2 +46.7	61.4	10 38.9 +47.2	61.5	11 07.4 +47.8	61.7	11 27									
27	8 28.4 +43.6	60.0	8 58.4 +44.2	60.1	9 28.2 +44.8	60.3	9 57.9 +45.4	60.4	10 27.5 +45.9	60.6	10 56.9 +46.5	60.7	11 26.1 +47.2	60.9	11 55.2 +47.7	61.1	12 27									
28	9 12.0 +43.4	59.3	9 42.6 +44.0	59.4	10 13.0 +44.7	59.6	10 43.3 +45.3	59.7	11 13.4 +46.0	59.9	11 43.4 +46.5	60.1	12 13.3 +47.1	60.3	12 42.9 +47.7	60.5	12 28									
29	9 55.4 +43.4	58.6	10 26.6 +44.0	58.7	10 57.7 +44.6	58.9	11 28.6 +45.2	59.1	11 59.4 +45.8	59.3	12 29.9 +46.5	59.4	13 00.4 +46.9	59.6	13 30.6 +47.6	59.8	13 29									
30	10 38.8 +43.3	57.9	11 10.6 +44.0	58.1	11 42.3 +44.5	58.2	12 13.8 +45.2	58.4	12 45.2 +45.7	58.6	13 16.4 +46.3	58.8	13 47.3 +46.9	59.0	14 18.2 +47.4	59.2	14 30									
31	11 22.1 +43.2	57.2	11 54.6 +43.8	57.4	12 26.8 +44.5	57.5	12 59.0 +45.0	57.7	13 30.9 +45.6	57.9	14 02.7 +46.2	58.1	14 34.2 +46.8	58.4	15 05.6 +47.4	58.6	15 31									
32	12 05.3 +43.1	56.5	12 38.4 +43.7	56.7	13 11.3 +44.3	56.9	13 44.0 +44.9	57.1	14 16.5 +45.5	57.3	14 48.9 +46.0	57.5	15 21.0 +46.7	57.7	15 53.0 +47.2	57.9	15 32									
33	12 48.4 +42.9	55.8	13 22.1 +43.5	56.0	13 55.6 +44.1	56.2	14 28.9 +44.8	56.4	15 02.0 +44.0	56.6	15 34.9 +46.0	56.8	16 07.7 +46.5	57.1	16 40.2 +47.1	57.3	16 33									
34	13 14.1 +42.9	54.3	14 49.1 +43.3	54.5	15 23.8 +43.9	54.8	15 58.3 +44.5	55.0	16 32.6 +45.2	55.2	17 06.8 +45.7	55.5	17 40.7 +46.2	55.7	18 14.3 +46.9	56.0	18 35									
35	14 14.2 +42.7	54.3	14 49.1 +43.3	54.5	15 23.8 +43.9	54.8	15 58.3 +44.5	55.0	16 32.6 +45.2	55.2	17 06.8 +45.7	55.5	17 40.7 +46.2	55.7	18 14.3 +46.9	56.0	18 35									
36	14 56.9 +42.6	53.6	15 32.4 +43.2	53.8	16 07.7 +43.8	54.1	16 42.8 +44.4	54.3	17 17.8 +45.9	54.5	17 52.5 +45.5	54.8	18 26.9 +46.2	55.1	19 01.2 +46.7	55.3	19 36									
37	15 39.5 +42.4	52.9	16 15.6 +43.0	53.1	16 51.5 +43.6	53.3	17 27.2 +44.3	53.6	18 02.7 +																	

75°, 285° L.H.A.

LATITUDE SAME NAME AS DECLINATION

{ L.H.A. greater than 180°Zn=Z
N. Lat. { L.H.A. less than 180°Zn=360°-Z }

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			Dec.
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	
0	10 32.7 +43.1	100.7	10 21.5 +43.8	100.9	10 10.0 +44.5	101.1	9 58.4 +45.2	101.3	9 46.6 +45.9	101.4	9 34.6 +46.6	101.6	9 22.4 +47.3	101.8	9 10.1 +47.9	101.9	0	10 32.7 +43.1	100.7	10 21.5 +43.8	100.9	10 10.0 +44.5	101.1	9 58.4 +45.2	101.3
1	11 15.8 +43.0	100.0	11 05.3 +43.7	100.2	10 54.5 +44.5	100.4	10 43.6 +45.2	100.6	10 32.5 +45.8	100.8	10 21.2 +46.5	101.0	10 09.7 +47.1	101.1	9 58.0 +47.8	101.3	1	11 15.8 +43.0	100.0	11 05.3 +43.7	100.2	10 54.5 +44.5	100.4	10 43.6 +45.2	100.6
2	11 58.8 +42.9	99.3	11 49.0 +43.6	99.5	11 39.0 +44.3	99.7	11 28.8 +45.0	99.9	11 18.3 +45.8	100.1	11 07.7 +46.4	100.3	10 56.8 +47.1	100.5	10 45.8 +47.7	100.7	2	11 58.8 +42.9	99.3	11 49.0 +43.6	99.5	11 39.0 +44.3	99.7	11 28.8 +45.0	99.9
3	12 41.7 +42.8	98.6	12 32.6 +43.6	98.8	12 23.3 +44.3	99.0	12 13.8 +45.0	99.2	12 04.1 +45.6	99.5	11 54.1 +46.3	99.7	11 43.9 +47.0	99.9	11 33.5 +47.7	100.1	3	12 41.7 +42.8	98.6	12 32.6 +43.6	98.8	12 23.3 +44.3	99.0	12 13.8 +45.0	99.2
4	13 24.5 +42.7	97.9	13 16.2 +43.4	98.1	13 07.6 +44.1	98.3	12 58.8 +44.8	98.6	12 49.7 +45.6	98.8	12 40.4 +46.3	99.0	12 30.9 +46.9	99.2	12 21.2 +47.5	99.5	4	13 24.5 +42.7	97.9	13 16.2 +43.4	98.1	13 07.6 +44.1	98.3	12 58.8 +44.8	98.6
5	14 07.2 +42.5	97.1	13 59.6 +43.3	97.4	13 51.7 +44.0	97.6	13 43.6 +44.7	97.9	13 35.3 +45.4	98.1	13 26.7 +46.1	98.4	13 17.8 +46.8	98.6	13 08.7 +47.5	98.8	5	14 07.2 +42.5	97.1	13 59.6 +43.3	97.4	13 51.7 +44.0	97.6	13 43.6 +44.7	97.9
6	14 49.7 +42.4	96.4	14 42.9 +43.1	96.7	14 35.7 +43.9	96.9	14 28.3 +44.7	97.2	14 20.7 +45.3	97.5	14 12.8 +46.0	97.7	14 04.6 +46.7	98.0	13 56.2 +47.3	98.2	6	14 49.7 +42.4	96.4	14 42.9 +43.1	96.7	14 35.7 +43.9	96.9	14 28.3 +44.7	97.2
7	15 32.1 +42.2	95.7	15 26.0 +43.0	96.0	15 19.6 +43.8	96.2	15 13.0 +44.4	96.5	15 06.0 +45.2	96.8	14 58.8 +45.9	97.0	14 51.3 +46.6	97.3	14 43.5 +47.3	97.6	7	15 32.1 +42.2	95.7	15 26.0 +43.0	96.0	15 19.6 +43.8	96.2	15 13.0 +44.4	96.5
8	16 14.3 +42.1	94.9	16 09.0 +42.9	95.2	16 03.4 +43.6	95.5	15 57.4 +44.4	95.8	15 51.2 +45.1	96.1	15 44.7 +45.5	96.4	15 37.9 +46.5	96.7	15 30.8 +47.2	96.9	8	16 14.3 +42.1	94.9	16 09.0 +42.9	95.2	16 03.4 +43.6	95.5	15 57.4 +44.4	95.8
9	16 56.4 +41.9	94.2	16 51.9 +42.7	94.5	16 47.0 +43.5	94.8	16 41.8 +44.2	95.1	16 36.3 +44.9	95.4	16 30.5 +45.6	95.7	16 24.4 +46.3	96.0	16 18.0 +47.0	96.3	9	16 56.4 +41.9	94.2	16 51.9 +42.7	94.5	16 47.0 +43.5	94.8	16 41.8 +44.2	95.1
10	17 38.3 +41.8	93.5	17 34.6 +42.5	93.8	17 30.5 +43.3	94.1	17 26.0 +44.1	94.4	17 21.2 +44.8	94.7	17 16.1 +45.6	95.0	17 10.7 +46.3	95.3	17 05.0 +46.9	95.6	10	17 38.3 +41.8	93.5	17 34.6 +42.5	93.8	17 30.5 +43.3	94.1	17 26.0 +44.1	94.4
11	18 20.1 +41.6	92.7	18 17.1 +42.4	93.0	18 13.8 +43.1	93.4	18 10.1 +43.9	93.7	18 06.0 +44.7	94.0	18 01.7 +45.3	94.3	17 57.0 +46.0	94.7	17 51.9 +46.8	95.0	11	18 20.1 +41.6	92.7	18 17.1 +42.4	93.0	18 13.8 +43.1	93.4	18 10.1 +43.9	93.7
12	19 01.7 +41.4	91.9	18 59.5 +42.1	92.3	18 56.9 +43.0	92.6	18 54.0 +43.7	93.0	18 50.7 +44.5	93.3	18 47.0 +45.3	93.7	18 43.0 +46.0	94.0	18 38.7 +46.6	94.3	12	19 01.7 +41.4	91.9	18 59.5 +42.1	92.3	18 56.9 +43.0	92.6	18 54.0 +43.7	93.0
13	19 43.1 +41.2	91.2	19 41.6 +42.0	91.5	19 39.9 +42.7	91.9	19 37.7 +43.6	92.2	19 35.2 +44.3	92.6	19 32.3 +45.0	93.0	19 29.0 +45.8	93.3	19 25.3 +46.5	93.7	13	19 43.1 +41.2	91.2	19 41.6 +42.0	91.5	19 39.9 +42.7	91.9	19 37.7 +43.6	92.2
14	20 24.3 +40.9	90.4	20 23.6 +41.8	90.8	20 22.6 +42.6	91.1	20 21.3 +43.3	91.5	20 19.5 +44.1	91.9	20 17.3 +44.9	92.3	20 14.8 +45.6	92.6	20 11.8 +46.4	93.0	14	20 24.3 +40.9	90.4	20 23.6 +41.8	90.8	20 22.6 +42.6	91.1	20 21.3 +43.3	91.5
15	21 05.2 +40.8	89.6	21 05.4 +41.6	90.0	21 05.2 +42.4	90.4	21 04.6 +43.2	90.8	21 03.6 +44.0	91.2	21 02.2 +44.7	91.5	21 00.4 +45.4	91.9	20 58.2 +46.1	92.3	15	21 05.2 +40.8	89.6	21 05.4 +41.6	90.0	21 05.2 +42.4	90.4	21 04.6 +43.2	90.8
16	21 46.0 +40.5	88.8	21 47.0 +41.4	89.2	21 47.6 +42.2	89.6	21 47.3 +43.0	90.0	21 47.6 +43.7	90.4	21 46.9 +44.5	90.8	21 45.8 +45.3	91.2	21 44.3 +46.0	91.6	16	21 46.0 +40.5	88.8	21 47.0 +41.4	89.2	21 47.6 +42.2	89.6	21 47.3 +43.0	90.0
17	22 26.5 +40.3	88.0	22 28.4 +41.1	88.4	22 29.8 +42.0	88.9	22 30.8 +42.7	89.3	22 31.3 +43.6	89.7	22 31.4 +43.3	90.1	22 31.1 +45.1	90.5	22 30.3 +45.9	90.9	17	22 26.5 +40.3	88.0	22 28.4 +41.1	88.4	22 29.8 +42.0	88.9	22 30.8 +42.7	89.3
18	23 06.8 +40.1	87.2	23 09.5 +40.9	87.7	23 11.8 +41.7	88.1	23 13.5 +42.6	88.5	23 14.9 +43.3	88.9	23 15.7 +44.2	89.4	23 16.2 +44.9	89.8	23 16.2 +45.6	90.2	18	23 06.8 +40.1	87.2	23 09.5 +40.9	87.7	23 11.8 +41.7	88.1	23 13.5 +42.6	88.5
19	23 46.9 +39.8	86.4	23 50.4 +40.7	86.9	23 53.5 +41.5	87.3	23 56.1 +42.3	87.7	23 58.2 +43.1	88.2	23 59.9 +43.9	88.6	24 01.1 +44.6	89.1	24 01.8 +45.4	89.5	19	23 46.9 +39.8	86.4	23 50.4 +40.7	86.9	23 53.5 +41.5	87.3	23 56.1 +42.3	87.7
20	24 26.7 +39.5	85.6	24 31.1 +40.4	86.1	24 35.0 +41.2	86.5	24 38.4 +42.0	87.0	24 41.3 +42.9	87.4	24 43.8 +43.7	87.9	24 45.7 +44.5	88.3	24 47.2 +45.3	88.8	20	24 26.7 +39.5	85.6	24 31.1 +40.4	86.1	24 35.0 +41.2	86.5	24 38.4 +42.0	87.0
21	25 06.2 +39.3	84.8	25 11.5 +40.1	85.2	25 16.2 +41.0	85.7	25 20.4 +41.9	86.2	25 24.2 +42.6	86.7	25 27.5 +43.4	87.1	25 30.2 +44.2	87.6	25 32.5 +45.0	88.1	21	25 06.2 +39.3	84.8	25 11.5 +40.1	85.2	25 16.2 +41.0	85.7	25 20.4 +41.9	86.2
22	25 45.5 +39.0	83.9	25 51.6 +39.8	84.4	25 57.2 +40.7	84.9	26 02.3 +41.5	85.4	26 06.8 +42.4	85.9	26 10.9 +43.2	86.4	26 14.4 +44.0	86.9	26 17.5 +44.8	87.3	22	25 45.5 +39.0	83.9	25 51.6 +39.8	84.4	25 57.2 +40.7	84.9	26 02.3 +41.5	85.4
23	26 24.5 +38.6	83.1	26 31.4 +39.6	83.6	26 37.9 +40.4	84.1	26 43.8 +41.3	84.6	26 49.2 +42.1	85.1	26 54.1 +42.9	85.6	26 58.4 +43.8	86.1	27 02.3 +44.5	86.6	23	26 24.5 +38.6	83.1	26 31.4 +39.6	83.6	26 37.9 +40.4	84.1	26 43.8 +41.3	84.6
24	27 03.1 +38.4	82.2	27 11.0 +39.2	82.7	27 18.3 +40.1	83.2	27 25.1 +40.9	83.8	27 31.3 +41.9	84.3	27 37.0 +42.7	84.8	27 42.2 +43.5	85.3	27 46.8 +44.3	85.8	24	27 03.1 +38.4	82.2	27 11.0 +39.2	82.7	27 18.3 +40.1	83.2	27 25.1 +40.9	83.8
25	27 41.5 +38.0	81.4	27 50.2 +38.9	81.9	27 58.4 +39.8	82.4	28 06.0 +40.7	82.9	28 13.2 +41.5	83.6	28 19.7 +42.4	84.0	28 25.7 +43.2	84.5	28 31.1 +44.1	85.1	25	27 41.5 +38.0	81.4	27 50.2 +38.9	81.9	27 58.4 +39.8	82.4	28 06.0 +40.7	82.9
26	28 19.5 +37.7	80.5	28 29.1 +38.6	81.0	28 38.2 +39.5	81.6	28 46.7 +40.4	82.1	28 54.7 +41.2	82.6	28 62.0 +41.9	83.2	29 02.1 +42.1	83.2	29 08.9 +42.9	83.7	26	28 19.5 +37.7	80.5	28 29.1 +38.6	81.0	28 38.2 +39.5	81.6	28 46.7 +40.4	82.1
27	28 57.2 +37.3	79.6	29 07.7 +38.2	80.1	29 17.7 +39.1	80.7	29 27.1 +40.0	81.3	29 35.9 +41.0	81.8	29 44.2 +41.8	82.4	29 51.8 +42.7	82.9	29 58.9 +43.5	83.5	27	28 57.2 +37.3	79.6	29 07.7 +38.2	80.1	29 17.7 +39.1	80.7	29 27.1 +40.0	81.3
28	29 34.5 +36.9	78.7	29 45.9 +37.9	79.3	29 56.8 +38.4	79.8	30 07.1 +39.7	80.4	30 16.9 +40.5	81.0	30 26.0 +41.4	81.5	30 34.5 +42.3	82.1	30 42.4 +43.2	82.7	28	29 34.5 +36.9	78.7	29 45.9 +37.9	79.3	29 56.8 +38.4	79.8	30 07.1 +39.7	80.4
29	30 11.4 +36.6	77.8	30 23.8 +37.5	78.4	30 35.6 +38.4	79.5	30 53.9 +39.5	80.3	30																

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 75° , 285°

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			Dec.									
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z										
0	10	32.7	-43.2	100.7	10	21.5	-44.0	100.9	10	10.0	-44.6	101.1	9	58.4	-45.3	101.3	9	46.6	-46.0	101.4	9	34.6	-46.7	101.6	9	22.4	-47.2	101.8	9	10.1	-47.9	101.9	0	
1	9	49.5	-43.3	101.4	9	37.5	-44.0	101.6	9	25.4	-44.7	101.8	9	13.1	-45.4	101.9	9	00.6	-46.1	102.1	8	47.9	-46.7	102.2	8	35.2	-47.4	102.4	8	22.2	-48.0	102.5	1	
2	9	06.2	-43.3	102.1	8	53.5	-44.0	102.3	8	40.7	-44.8	102.4	8	27.7	-45.5	102.6	8	14.5	-46.1	102.7	8	01.2	-46.7	102.9	7	47.8	-47.4	103.0	7	34.2	-48.0	103.1	3	
3	8	22.9	-43.5	102.8	8	09.5	-44.2	103.0	7	55.9	-44.8	103.1	7	42.2	-45.5	103.2	7	28.4	-46.2	103.4	7	14.5	-46.9	103.5	7	00.4	-47.5	103.6	6	46.2	-48.1	103.7	3	
4	7	39.4	-43.5	103.5	7	25.3	-44.2	103.8	7	11.1	-44.6	103.8	6	56.7	-45.3	103.9	6	27.6	-46.2	104.0	6	12.9	-47.5	104.2	5	58.1	-48.1	104.3	4					
5	6	55.9	-43.6	104.2	6	41.1	-44.3	104.3	6	26.2	-45.0	104.5	6	11.2	-45.7	104.6	5	56.0	-46.2	104.7	5	40.8	-46.9	104.8	5	25.4	-47.5	104.9	5	10.0	-48.1	104.9	5	
6	6	12.3	-43.6	104.9	5	56.8	-44.3	105.0	5	41.2	-45.0	105.1	5	25.5	-45.6	105.2	5	09.8	-46.4	105.3	4	53.9	-47.0	105.4	4	37.9	-47.6	105.5	6	21.9	-48.2	105.5	6	
7	5	28.7	-43.7	105.6	5	12.5	-44.3	105.7	4	56.2	-45.0	105.8	4	39.9	-45.7	105.9	4	23.4	-46.3	105.9	4	06.9	-46.9	106.0	3	50.3	-47.5	106.1	3	33.7	-48.2	106.1	7	
8	4	45.0	-43.7	106.3	4	28.2	-44.4	106.4	4	11.2	-45.6	106.4	3	54.2	-45.7	106.5	3	37.1	-46.4	106.6	3	20.0	-47.0	106.6	3	02.8	-47.7	106.7	8	45.5	-48.2	106.7	8	
9	4	01.3	-43.7	107.0	3	43.8	-44.4	107.0	3	26.2	-45.1	107.1	3	08.5	-45.8	107.2	2	50.7	-46.3	107.2	2	33.0	-47.0	107.3	2	15.1	-47.6	107.3	9	57.3	-48.2	107.3	9	
10	3	17.6	-43.8	107.7	2	59.4	-44.5	107.7	2	41.1	-45.1	107.8	2	22.7	-45.7	107.8	2	04.4	-46.4	107.8	1	46.0	-47.1	107.9	1	27.5	-47.6	107.9	1	09.1	-48.3	107.9	10	
11	2	33.8	-43.8	108.4	2	14.9	-44.5	108.4	1	56.0	-45.2	108.4	1	37.0	-45.8	108.5	1	18.0	-46.5	108.5	0	58.9	-47.0	108.5	0	39.9	-47.7	108.5	0	20.8	-48.2	108.5	11	
12	1	50.0	-43.8	109.0	1	30.4	-44.4	109.1	1	10.8	-45.1	109.1	0	51.2	-45.8	109.1	0	31.5	-46.4	109.1	0	11.9	-47.0	109.1	0	0.78	-47.6	109.1	0	27.4	-48.2	109.1	12	
13	1	06.2	-43.8	109.7	0	46.0	-44.5	109.7	0	25.7	-45.2	109.7	0	05.4	-45.8	109.8	0	14.9	+46.4	109.8	0	35.1	+47.1	109.8	0	55.4	+47.6	109.8	0	15.6	+48.3	109.8	13	
14	0	22.4	-43.8	110.4	0	01.5	-44.5	110.4	0	19.5	+45.1	110.4	0	40.4	+45.7	110.4	0	1.03	+46.4	110.4	1	22.2	+47.0	110.4	1	43.0	+47.7	110.4	1	03.9	+48.2	110.4	14	
15	0	21.4	+43.9	68.9	0	43.0	+44.5	68.9	1	04.6	+45.1	68.9	1	26.1	+45.8	69.0	1	47.7	+46.4	69.0	2	09.2	+47.0	69.0	2	30.7	+47.6	69.1	2	52.1	+48.2	69.1	15	
16	1	05.3	+43.8	68.2	1	27.5	+44.5	68.2	1	49.7	+45.1	68.3	2	11.9	+45.8	68.3	2	34.1	+46.3	68.3	2	56.2	+47.0	68.4	3	18.3	+47.5	68.4	3	40.3	+48.2	68.5	16	
17	1	49.1	+43.8	67.5	2	12.0	+44.4	67.6	2	34.8	+45.1	67.6	2	57.7	+45.7	67.7	3	20.4	+46.4	67.7	3	43.2	+46.9	67.8	4	05.8	+47.6	67.8	4	28.5	+48.1	67.9	17	
18	2	32.9	+43.7	66.9	2	56.4	+44.5	66.9	3	19.9	+45.1	67.0	3	43.4	+45.7	67.0	4	06.8	+46.3	67.1	4	30.1	+47.0	67.1	4	53.4	+47.5	67.2	5	16.6	+48.1	67.3	18	
19	3	16.6	+43.8	66.2	3	40.9	+44.3	66.2	4	05.0	+45.0	66.3	4	29.1	+45.7	66.4	4	53.1	+46.3	66.4	5	17.1	+46.8	66.5	5	40.9	+47.5	66.6	6	04.7	+48.1	66.7	19	
20	4	40.0	+43.7	65.5	4	25.2	+44.4	65.6	4	50.0	+45.0	65.6	5	14.8	+45.6	65.6	5	39.4	+46.2	65.8	6	03.9	+46.9	65.9	6	28.4	+47.4	66.0	6	6	+52.8	+48.0	66.1	20
21	4	44.1	+43.7	64.8	5	09.6	+44.3	64.9	5	35.0	+45.0	65.0	6	00.4	+45.6	65.1	6	25.6	+46.2	65.2	6	50.8	+46.8	65.3	7	15.8	+47.4	65.4	7	40.8	+48.0	65.5	21	
22	5	27.8	+43.6	64.1	5	53.9	+44.3	64.2	6	20.0	+44.9	64.3	6	46.0	+45.5	64.4	7	11.8	+46.2	64.5	7	37.6	+46.7	64.6	8	03.2	+47.4	64.8	8	28.8	+47.9	64.9	22	
23	6	11.4	+43.6	63.4	6	38.2	+44.2	63.5	7	04.9	+44.8	63.6	7	31.5	+45.4	63.7	7	58.0	+46.0	63.9	8	24.3	+46.7	64.0	8	50.6	+47.2	64.3	23					
24	6	55.0	+43.5	62.7	7	22.4	+44.2	62.8	7	49.7	+44.8	63.0	8	16.9	+45.4	63.1	8	44.0	+46.1	63.2	9	11.0	+46.6	63.4	9	37.8	+47.2	63.5	10					
25	7	38.5	+43.4	62.0	8	06.6	+44.0	62.2	8	34.5	+44.7	62.3	9	02.3	+45.4	62.4	9	30.1	+45.9	62.6	9	57.6	+46.6	62.7	10	25.0	+47.2	62.9	10					
26	8	21.9	+43.4	61.3	8	50.6	+44.0	61.5	9	19.2	+44.7	61.6	9	47.7	+45.2	61.8	10	16.0	+45.9	61.9	11	12.2	+47.0	62.3	11	40.0	+47.6	62.4	26					
27	9	05.3	+43.3	60.6	9	34.6	+44.0	60.8	10	03.9	+44.5	60.9	10	32.9	+45.2	61.1	11	01.9	+45.7	61.3	11	30.6	+46.4	61.4	11	59.2	+47.0	61.6	12					
28	9	48.6	+43.2	59.9	10	18.6	+43.8	60.1	10	48.4	+44.5	60.3	11	18.1	+45.1	60.4	11	47.6	+45.7	60.6	12	17.0	+46.3	60.8	12	46.2	+46.9	61.0	13					
29	10	31.8	+43.1	59.2	11	02.4	+43.7	59.4	11	32.9	+43.4	59.6	12	03.2	+44.9	59.8	12	33.3	+45.6	59.9	13	03.3	+46.2	60.1	13	33.1	+46.7	60.3	14					
30	11	14.9	+43.0	58.5	11	46.1	+43.7	58.7	12	17.2	+44.3	58.9	12	48.1	+44.9	59.1	13	18.9	+45.5	59.3	13	49.5	+46.0	59.5	14	19.8	+46.7	59.7	14					
31	11	57.9	+42.9	57.8	12	29.8	+43.5	58.0	13	01.5	+44.1	58.2	13	33.0	+44.8	58.4	14	04.4	+45.3	58.6	14	35.6	+46.0	58.8	15	06.5	+46.6	59.0	15					
32	12	40.8	+42.8	57.1	13	13.3	+43.4	57.3	13	45.6	+44.6	57.5	14	17.8	+44.6	57.7	14	49.7	+45.3	57.9	15	21.5	+45.8	58.2	16	39.5	+46.3	58.4	16					
33	13	23.6	+42.6	56.4	13	56.7	+43.9	56.6	14	29.7	+43.9	56.8	15	02.4	+45.5	57.0	15	35.0	+46.2	57.2	16	07.9	+46.8	57.5	17	25.8	+47.2	57.7	18					
34	14	06.2	+42.5	55.7	14	20.4	+43.9	55.9	15	36.3	+44.0	56.1	16	21.1	+45.2	56.3	17	21.1	+45.7	56.4	18	12.0	+46.0	56.6	18	32.0	+46.5	56.7	19					
35	14	48.8	+42.4	54.9	15	23.2	+43.0	55.2	15	57.3	+43.7	55.4	16</																					

76°, 284° L.H.A.

LATITUDE SAME NAME AS DECLINATION

{ L.H.A. greater than 180°Zn=Z
N. Lat. { L.H.A. less than 180°Zn=360°-Z }

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			Dec.
	Hc	d	Z																						
0	9 51.0	+43.0	100.0	9 40.5	+43.7	100.2	9 29.8	+44.5	100.3	9 19.0	+45.1	100.5	9 07.9	+45.9	100.7	8 56.8	+46.5	100.8	8 45.4	+47.2	101.0	8 33.9	+47.8	101.1	0
1	10 34.0	+42.9	99.3	10 24.2	+43.7	99.5	10 14.3	+44.3	99.7	10 04.1	+45.1	99.8	9 53.8	+45.7	100.0	9 43.3	+46.4	100.2	9 32.6	+47.1	100.3	9 21.7	+47.7	100.5	1
2	11 16.9	+42.8	98.6	11 07.9	+43.5	98.8	10 58.6	+44.3	99.0	10 49.2	+44.9	99.2	10 39.5	+45.7	99.3	10 29.7	+46.3	99.5	10 19.7	+47.0	99.7	10 09.4	+47.7	99.9	2
3	11 59.7	+42.7	97.9	11 51.4	+43.5	98.1	11 42.9	+44.2	98.3	11 34.1	+44.9	98.5	11 25.2	+45.6	98.7	11 16.0	+46.3	98.9	11 06.7	+46.9	99.1	10 57.1	+47.6	99.3	3
4	12 42.4	+42.6	97.1	12 34.9	+43.3	97.4	12 27.1	+44.7	97.6	12 19.0	+44.8	97.8	12 10.8	+45.5	98.0	12 02.3	+46.2	98.2	11 53.6	+46.8	98.4	11 44.7	+47.5	98.6	4
5	13 25.0	+42.5	96.4	13 18.2	+43.2	96.7	13 11.1	+44.0	96.9	13 03.8	+44.7	97.1	12 56.3	+45.3	97.4	12 48.5	+46.0	97.6	12 40.4	+46.8	97.8	12 32.2	+47.4	98.0	5
6	14 07.5	+42.3	95.7	14 01.4	+43.1	95.9	13 55.1	+43.8	96.2	13 48.5	+44.5	96.4	13 41.6	+45.3	96.7	13 34.5	+46.0	96.9	13 27.2	+46.6	97.2	13 19.6	+47.3	97.4	6
7	14 49.8	+42.2	95.0	14 44.5	+43.0	95.5	14 38.9	+43.7	95.5	14 33.0	+44.5	95.7	14 26.9	+45.2	96.0	14 20.5	+45.9	96.3	14 13.8	+46.6	96.5	14 06.9	+47.2	96.8	7
8	15 32.0	+42.1	94.2	15 27.5	+42.8	94.5	15 22.6	+43.6	94.8	15 17.5	+44.3	95.0	15 12.1	+45.0	95.3	15 06.4	+45.7	95.6	15 00.4	+46.4	95.9	14 54.1	+47.1	96.1	8
9	16 14.1	+41.9	93.5	16 10.3	+42.7	93.8	16 06.2	+43.4	94.1	16 01.8	+44.2	94.3	15 57.1	+44.9	94.6	15 52.1	+45.6	94.9	15 46.8	+46.3	95.2	15 41.2	+47.0	95.5	9
10	16 56.0	+41.7	92.7	16 53.0	+42.5	93.0	16 49.6	+43.3	93.3	16 46.0	+44.0	93.6	16 42.0	+44.8	93.9	16 37.7	+45.5	94.2	16 33.1	+46.2	94.5	16 28.2	+46.9	94.8	10
11	17 37.7	+41.6	92.0	17 35.5	+42.3	92.3	17 32.9	+43.1	92.6	17 30.0	+43.9	92.9	17 26.8	+44.6	93.2	17 23.2	+45.3	93.6	17 19.3	+46.1	93.9	17 15.1	+46.7	94.2	11
12	18 19.3	+41.3	91.2	18 17.8	+42.2	91.6	18 16.0	+43.0	91.9	18 13.9	+43.7	92.2	18 11.4	+44.2	92.5	18 08.5	+45.2	92.9	18 05.4	+45.9	93.2	18 01.8	+46.6	93.5	12
13	19 00.6	+41.2	90.5	19 00.0	+42.0	90.8	18 59.0	+42.7	91.2	18 57.6	+43.5	91.5	18 55.8	+44.3	91.8	18 53.7	+45.1	92.2	18 51.3	+45.7	92.5	18 48.4	+46.5	92.9	13
14	19 41.8	+41.0	89.7	19 42.0	+41.8	90.0	19 41.7	+42.6	90.4	19 41.1	+43.4	90.8	19 40.1	+44.1	91.1	19 38.8	+44.8	91.5	19 37.0	+45.6	91.8	19 34.9	+46.3	92.2	14
15	20 22.8	+40.8	88.9	20 23.8	+41.5	89.3	20 24.3	+42.4	89.7	20 24.5	+43.2	90.0	20 24.2	+44.0	90.4	20 23.6	+44.7	90.8	20 22.6	+45.5	91.1	20 21.2	+46.2	91.5	15
16	21 03.6	+40.6	88.1	21 05.3	+41.4	88.5	21 06.7	+42.2	88.9	21 07.7	+42.9	89.3	21 08.2	+43.8	89.7	21 08.3	+44.6	90.1	21 08.1	+45.2	90.4	21 07.4	+46.0	90.8	16
17	21 44.2	+40.3	87.3	21 46.7	+41.2	87.7	21 48.9	+42.0	88.1	21 50.6	+42.8	88.5	21 52.0	+43.5	88.9	21 52.9	+44.3	89.3	21 53.3	+45.1	89.7	21 53.4	+45.8	90.1	17
18	22 24.5	+40.1	86.5	22 27.9	+40.9	87.0	22 30.9	+41.7	87.4	22 33.4	+42.6	87.8	22 35.5	+43.4	88.2	22 37.2	+44.1	88.6	22 38.4	+44.9	89.0	22 39.2	+45.7	89.4	18
19	23 04.6	+39.8	85.7	23 08.8	+40.7	86.2	23 12.6	+41.5	86.6	23 16.0	+42.3	87.0	23 18.9	+43.1	87.4	23 21.3	+43.9	87.9	23 23.3	+44.7	88.3	23 24.9	+45.4	88.7	19
20	23 44.4	+39.6	84.9	23 49.5	+40.4	85.4	23 54.1	+41.3	85.8	23 58.3	+42.1	86.2	24 02.0	+42.9	86.7	24 05.2	+43.7	87.1	24 08.0	+44.5	87.6	24 10.3	+45.3	88.0	20
21	24 24.0	+39.3	84.1	24 29.9	+40.2	84.5	24 35.4	+41.0	85.0	24 40.4	+41.9	85.5	24 44.9	+42.7	85.9	24 48.9	+43.5	86.4	24 52.5	+44.3	86.8	24 55.6	+45.0	87.3	21
22	25 03.3	+39.1	83.3	25 10.1	+39.9	83.7	25 16.4	+40.8	84.2	25 22.3	+41.6	84.7	25 27.6	+42.4	85.1	25 32.4	+43.3	85.6	25 36.8	+44.0	86.1	25 40.6	+44.8	86.6	22
23	25 42.4	+38.7	82.4	25 50.0	+39.6	82.9	25 57.2	+40.5	83.4	26 03.9	+41.3	83.9	26 10.0	+42.2	84.4	26 15.7	+42.9	84.8	26 20.8	+43.8	85.3	26 25.4	+44.6	85.8	23
24	26 21.1	+38.4	81.6	26 29.6	+39.4	82.1	26 37.7	+40.2	82.6	26 45.2	+41.0	83.1	26 52.2	+41.9	83.6	26 58.6	+42.8	84.1	27 04.6	+43.5	84.6	27 10.0	+44.3	85.1	24
25	26 55.9	+38.2	80.7	27 09.0	+39.0	81.2	27 17.9	+39.9	81.7	27 26.2	+40.8	82.2	27 34.1	+41.6	82.8	27 41.4	+42.4	83.3	27 48.1	+43.3	83.8	27 54.3	+44.1	84.3	25
26	27 37.7	+37.8	79.8	27 48.0	+38.7	80.4	27 57.8	+39.5	80.9	28 07.0	+40.5	81.4	28 15.7	+41.3	81.9	28 23.8	+42.2	82.5	28 31.4	+43.0	83.0	28 38.4	+43.8	83.6	26
27	28 15.5	+37.4	79.0	28 26.7	+38.3	79.5	28 37.3	+39.3	80.0	28 47.5	+40.1	80.6	28 57.0	+41.0	81.1	29 06.0	+41.9	81.7	29 14.4	+42.7	82.2	29 22.2	+43.6	82.8	27
28	28 52.9	+37.1	78.1	29 05.0	+38.1	78.6	29 16.6	+38.9	79.2	29 27.6	+39.8	79.7	29 38.0	+40.7	80.3	29 47.9	+41.5	80.8	29 57.1	+42.4	81.4	30 05.8	+43.2	82.0	28
29	29 30.0	+36.8	77.2	29 43.1	+37.6	77.7	29 55.5	+38.6	78.3	30 07.4	+39.5	78.9	30 18.7	+40.4	79.4	30 29.4	+41.3	80.0	30 39.5	+42.1	80.6	30 49.0	+43.0	81.2	29
30	30 06.8	+36.3	76.3	30 20.7	+37.3	76.8	30 34.1	+38.2	77.4	30 46.9	+39.1	78.0	30 59.1	+40.0	78.6	31 10.7	+40.9	79.2	31 21.6	+41.8	79.8	31 32.0	+42.6	80.4	30
31	30 43.1	+36.0	75.3	30 58.0	+36.9	75.9	31 12.3	+37.8	76.5	31 26.0	+38.7	77.1	31 39.1	+39.6	77.7	31 51.6	+40.5	78.3	32 03.4	+41.4	78.9	32 14.6	+42.3	79.5	31
32	31 19.1	+35.5	74.4	31 34.9	+36.5	75.0	31 50.1	+37.4	75.6	32 04.7	+38.4	76.2	32 18.7	+39.3	76.8	32 32.1	+40.2	77.4	32 44.8	+41.1	78.1	32 56.9	+42.0	78.7	32
33	31 54.6	+35.1	73.5	32 11.4	+36.0	74.1	32 27.5	+37.1	74.7	32 43.1	+37.9	75.3	32 58.0	+38.9	75.9	33 12.3	+39.8	76.5	33 25.9	+40.7	77.2	33 38.9	+41.6	77.8	33
34	32 29.7	+34.7	72.5	33 04.6	+36.6	73.1	33 20.1	+37.6	74.4	33 36.9	+38.5	75.0	33 52.1	+39.4	75.6	34 06.6	+40.4	76.3	34 20.5	+41.2	77.0	34 20.5	+41.2	77.0	34
35	33 04.4	+34.2	71.5	33 23.1	+35.2	72.2	33 41.2	+36.1	72.8	33 58.6	+37.1	73.4	34 15.4	+38.0	74.1	34 31.5	+39.0	74.7	34 47.0	+39.9	75.4	35 01.7	+40.9	76.1	35
36	33 38.6	+33.7	70.5	34 17.3	+35.7	71.2	34 17.3	+35.7	71.8	34 35.7	+36.7	72.5	34 53.4	+37.6	73.1	35 10.5	+36.5	73.8	35 26.9	+39.5	74.5	35 42.6	+40.4	75.2	36
37	34 12.3	+33.3	69.6	34 33.0	+34.0	70.2	34 53.0	+35.2	70.8	35 12.4	+36.1	71.5	35 31.0	+37.2	72.2	3									

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 76° , 284°

S. Lat. { L.H.A. greater than 180° $Zn=180^{\circ}-Z$
 I H A less than 180° $7n=180^{\circ}+7$

L.H.A. 104° , 256°

77°, 283° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180°Zn=Z
L.H.A. less than 180°Zn=360°-Z

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			Dec.	
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z		
0	9 09.2 +42.9	99.3	8 59.4 +43.7	99.4	8 49.5 +44.4	99.6	8 39.4 +45.1	99.7	8 29.2 +45.8	99.9	8 18.8 +46.5	100.0	8 08.3 +47.1	100.2	7 57.6 +47.8	100.3	0	9 45.4 +47.6	99.7	9 45.4 +47.6	99.7	9 45.4 +47.6	99.7	9 45.4 +47.6	99.7	0
1	9 52.1 +42.8	98.6	9 43.1 +43.5	98.7	9 33.9 +44.3	98.9	9 24.5 +45.0	99.1	9 15.0 +45.6	99.2	9 05.3 +46.3	99.4	8 55.4 +47.0	99.5	8 45.4 +47.6	99.7	1	9 45.4 +47.6	99.7	9 45.4 +47.6	99.7	9 45.4 +47.6	99.7	9 45.4 +47.6	99.7	1
2	10 34.9 +42.8	97.9	10 26.6 +43.5	98.0	10 18.2 +44.2	98.2	10 09.5 +44.9	98.4	10 00.6 +45.6	98.6	9 51.6 +46.3	98.7	9 42.4 +46.9	98.9	9 33.0 +47.6	99.1	2	9 45.4 +47.6	99.7	9 45.4 +47.6	99.7	9 45.4 +47.6	99.7	9 45.4 +47.6	99.7	2
3	11 17.7 +42.6	97.1	11 10.1 +43.4	97.3	11 02.4 +44.1	97.5	10 54.4 +44.8	97.7	10 46.2 +45.6	97.9	10 37.9 +46.2	98.1	10 29.3 +46.9	98.3	10 20.6 +47.5	98.5	3	9 45.4 +47.6	99.7	9 45.4 +47.6	99.7	9 45.4 +47.6	99.7	9 45.4 +47.6	99.7	3
4	12 00.3 +42.6	96.4	11 53.5 +43.3	96.6	11 46.5 +44.0	96.8	11 39.2 +44.7	97.0	11 31.8 +45.4	97.2	11 24.1 +46.1	97.4	11 16.2 +46.8	97.6	11 08.1 +47.5	97.8	4	9 45.4 +47.6	99.7	9 45.4 +47.6	99.7	9 45.4 +47.6	99.7	9 45.4 +47.6	99.7	4
5	12 42.9 +42.4	95.7	12 36.8 +43.1	95.9	12 30.5 +43.9	96.1	12 23.9 +44.7	96.4	12 17.2 +45.3	96.6	12 10.2 +46.0	96.8	12 03.0 +46.7	97.0	11 55.6 +47.3	97.2	5	9 45.4 +47.6	99.7	9 45.4 +47.6	99.7	9 45.4 +47.6	99.7	9 45.4 +47.6	99.7	5
6	13 25.3 +42.3	95.0	13 19.9 +43.1	95.2	13 14.4 +43.8	95.4	13 08.6 +44.5	95.7	13 02.5 +45.2	95.9	12 56.2 +45.9	96.1	12 49.7 +46.6	96.4	12 42.9 +47.3	96.6	6	9 45.4 +47.6	99.7	9 45.4 +47.6	99.7	9 45.4 +47.6	99.7	9 45.4 +47.6	99.7	6
7	14 07.6 +42.1	94.2	14 03.0 +42.9	94.5	13 58.2 +43.6	94.7	13 53.1 +44.4	95.0	13 47.7 +45.1	95.2	13 42.1 +45.8	95.5	13 36.3 +46.5	95.7	13 30.2 +47.1	96.0	7	9 45.4 +47.6	99.7	9 45.4 +47.6	99.7	9 45.4 +47.6	99.7	9 45.4 +47.6	99.7	7
8	14 49.7 +42.0	93.5	14 45.9 +42.8	93.8	14 41.8 +43.6	94.0	14 37.5 +44.2	94.3	14 32.8 +45.0	94.6	14 27.9 +45.7	94.8	14 22.8 +46.4	95.1	14 17.3 +47.1	95.3	8	9 45.4 +47.6	99.7	9 45.4 +47.6	99.7	9 45.4 +47.6	99.7	9 45.4 +47.6	99.7	8
9	15 31.7 +41.9	92.8	15 28.7 +42.6	93.0	15 25.4 +43.4	93.3	15 21.7 +44.2	93.6	15 17.8 +44.9	93.9	15 13.6 +45.6	94.1	15 09.2 +46.3	94.4	15 04.4 +47.0	94.7	9	9 45.4 +47.6	99.7	9 45.4 +47.6	99.7	9 45.4 +47.6	99.7	9 45.4 +47.6	99.7	9
10	16 13.6 +41.7	92.0	16 11.3 +42.5	92.3	16 08.8 +43.2	92.6	16 05.9 +44.0	92.9	16 02.7 +44.7	93.2	15 59.2 +45.5	93.5	15 55.5 +46.1	93.7	15 51.4 +46.8	94.0	10	9 44.3 +46.2	90.4	9 44.3 +46.2	90.4	9 44.3 +46.2	90.4	9 44.3 +46.2	90.4	10
11	16 55.3 +41.5	91.3	16 53.8 +42.3	91.6	16 52.0 +43.1	91.9	16 49.9 +43.8	92.2	16 47.4 +44.6	92.5	16 44.7 +45.3	92.8	16 41.6 +46.0	93.1	16 38.2 +46.7	93.4	11	9 44.3 +46.2	90.4	9 44.3 +46.2	90.4	9 44.3 +46.2	90.4	9 44.3 +46.2	90.4	11
12	17 36.8 +41.4	90.5	17 36.1 +42.2	90.8	17 35.1 +42.9	91.1	17 33.7 +43.7	91.5	17 32.0 +44.5	91.8	17 30.0 +45.2	92.1	17 27.6 +45.9	92.4	17 24.9 +46.6	92.7	12	9 44.3 +46.2	90.4	9 44.3 +46.2	90.4	9 44.3 +46.2	90.4	9 44.3 +46.2	90.4	12
13	18 18.2 +41.2	89.8	18 18.3 +42.0	90.1	18 18.0 +42.8	90.4	18 17.4 +43.6	90.7	18 16.5 +44.3	91.1	18 15.2 +45.0	91.4	18 13.5 +45.8	91.7	18 11.5 +46.5	92.1	13	9 44.3 +46.2	90.4	9 44.3 +46.2	90.4	9 44.3 +46.2	90.4	9 44.3 +46.2	90.4	13
14	18 59.4 +41.0	89.0	19 00.3 +41.8	89.3	19 00.8 +42.6	89.7	19 01.0 +43.3	90.0	19 00.8 +44.1	90.4	19 00.2 +44.9	90.7	18 59.3 +45.6	91.1	18 58.0 +46.3	91.4	14	9 44.3 +46.2	90.4	9 44.3 +46.2	90.4	9 44.3 +46.2	90.4	9 44.3 +46.2	90.4	14
15	19 40.4 +40.8	88.2	19 42.1 +41.6	88.6	19 43.4 +42.4	88.9	19 44.3 +43.2	89.3	19 44.9 +43.9	89.6	19 45.1 +44.7	90.0	19 44.9 +45.4	90.4	19 44.3 +46.2	90.7	15	9 44.3 +46.2	90.4	9 44.3 +46.2	90.4	9 44.3 +46.2	90.4	9 44.3 +46.2	90.4	15
16	20 21.2 +40.6	87.4	20 23.7 +41.4	87.8	20 25.8 +42.2	88.2	20 27.5 +43.0	88.5	20 28.8 +43.8	88.9	20 29.8 +44.5	89.3	20 30.3 +45.3	89.7	20 30.5 +46.0	90.0	16	9 44.3 +46.2	90.4	9 44.3 +46.2	90.4	9 44.3 +46.2	90.4	9 44.3 +46.2	90.4	16
17	21 01.8 +40.3	86.6	21 05.1 +41.2	87.0	21 08.0 +42.0	87.4	21 10.5 +42.8	87.8	21 12.6 +43.6	88.2	21 14.3 +45.3	88.6	21 15.6 +45.1	89.0	21 16.5 +45.8	89.4	17	9 44.3 +46.2	90.4	9 44.3 +46.2	90.4	9 44.3 +46.2	90.4	9 44.3 +46.2	90.4	17
18	21 42.1 +40.2	85.9	21 46.3 +41.0	86.2	21 50.0 +41.8	86.6	21 53.3 +42.6	87.0	21 56.2 +43.4	87.5	21 58.6 +44.2	87.9	22 00.7 +44.9	88.3	22 02.3 +45.6	88.7	18	9 44.3 +46.2	90.4	9 44.3 +46.2	90.4	9 44.3 +46.2	90.4	9 44.3 +46.2	90.4	18
19	22 22.3 +39.9	85.0	22 27.3 +40.7	85.5	22 31.8 +41.5	85.9	22 35.9 +42.4	86.3	22 39.6 +43.1	86.7	22 42.8 +43.9	87.1	22 45.6 +44.7	87.5	22 47.9 +45.5	88.0	19	9 44.3 +46.2	90.4	9 44.3 +46.2	90.4	9 44.3 +46.2	90.4	9 44.3 +46.2	90.4	19
20	23 02.2 +39.6	84.2	23 08.0 +40.5	84.7	23 13.3 +41.4	85.1	23 18.3 +42.1	85.5	23 22.7 +43.0	85.9	23 26.7 +43.8	86.4	23 30.3 +44.5	86.8	23 33.4 +45.3	87.2	20	9 44.3 +46.2	90.4	9 44.3 +46.2	90.4	9 44.3 +46.2	90.4	9 44.3 +46.2	90.4	20
21	23 41.8 +39.4	83.4	23 48.5 +40.2	83.9	23 54.7 +41.1	84.3	24 04.4 +41.8	84.7	24 05.7 +42.7	85.2	24 10.5 +43.5	85.6	24 14.8 +44.3	86.1	24 18.7 +45.0	86.5	21	9 44.3 +46.2	90.4	9 44.3 +46.2	90.4	9 44.3 +46.2	90.4	9 44.3 +46.2	90.4	21
22	24 21.2 +39.1	82.6	24 28.7 +40.0	83.0	24 35.8 +40.8	83.5	24 42.3 +41.7	84.0	24 48.4 +42.5	84.4	24 54.0 +43.3	84.9	24 59.1 +44.1	85.3	25 03.7 +44.9	85.8	22	9 44.3 +46.2	90.4	9 44.3 +46.2	90.4	9 44.3 +46.2	90.4	9 44.3 +46.2	90.4	22
23	25 00.3 +38.9	81.8	25 08.7 +39.7	82.2	25 16.6 +40.5	82.7	25 24.0 +41.5	83.2	25 30.9 +42.2	83.6	25 37.3 +43.7	84.0	26 3.7 +44.3	84.4	26 20.3 +42.8	83.3	23	9 44.3 +46.2	90.4	9 44.3 +46.2	90.4	9 44.3 +46.2	90.4	9 44.3 +46.2	90.4	23
24	25 39.2 +38.5	80.9	25 48.4 +39.4	81.4	25 57.1 +40.3	81.9	26 0.4 +45.4	82.4	26 13.1 +42.0	82.8	26 20.3 +42.4	83.2	26 27.0 +42.8	83.6	26 33.2 +44.4	84.3	24	9 44.3 +46.2	90.4	9 44.3 +46.2	90.4	9 44.3 +46.2	90.4	9 44.3 +46.2	90.4	24
25	26 17.7 +38.3	80.2	26 27.8 +39.1	80.6	26 37.4 +40.0	81.0	26 46.5 +40.8	81.5	26 55.1 +41.6	82.0	27 03.1 +42.5	82.5	27 10.6 +43.4	83.1	27 17.6 +44.1	83.6	25	9 44.3 +46.2	90.4	9 44.3 +46.2	90.4	9 44.3 +46.2	90.4	9 44.3 +46.2	90.4	25
26	26 56.0 +37.9	79.2	27 06.9 +38.8	79.7	27 17.4 +39.7	80.2	27 27.3 +40.6	80.7	27 36.7 +41.5	81.2	27 45.6 +42.3	81.8	27 54.0 +43.0	82.3	28 01.7 +43.9	82.8	26	9 44.3 +46.2	90.4	9 44.3 +46.2	90.4	9 44.3 +46.2	90.4	9 44.3 +46.2	90.4	26
27	27 33.9 +37.6	78.3	27 45.7 +38.5	78.8	27 51.7 +39.4	79.4	28 0.9 +40.7	79.9	28 18.2 +41.1	80.4	28 27.9 +41.9	81.0	28 37.0 +42.8	81.5	28 45.6 +43.6	82.0	27	9 44.3 +46.2	90.4	9 44.3 +46.2	90.4	9 44.3 +46.2	90.4	9 44.3 +46.2	90.4	27
28	28 11.5 +37.2	77.4	28 24.2 +38.2	78.0	28 36.5 +39.0	78.5	28 48.1 +40.0	79.0	28 59.3 +40.8	79.6	29 09.8 +41.7	80.1	29 19.8 +42.5	80.7	29 29.2 +43.4	81.2	28	9 44.3 +46.2	90.4	9 44.3 +46.2	90.4	9 44.3 +46.2	90.4	9 44.3 +46.2	90.4	28
29	28 48.7 +36.9	76.6	29 01.4 +37.6	77.1	29 15.5 +38.7	7																				

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 77° , 283°

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			Dec.		
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z			
0	9 09.2 -43.1	99.3	8 59.4 -43.7	99.4	8 49.5 -44.4	99.6	8 39.4 -45.1	99.7	8 29.2 -45.8	99.9	8 18.8 -46.4	100.0	8 08.3 -47.1	100.2	7 57.6 -47.7	100.3	0	7 09.9 -47.8	100.9	1	7 21.2 -47.2	100.8	7 09.9 -47.8	100.9	0		
1	8 26.1 -43.0	100.0	8 15.7 -43.8	100.1	8 05.1 -44.6	100.3	7 54.3 -45.2	100.4	7 43.4 -45.9	100.5	7 32.4 -46.6	100.7	7 21.2 -47.2	100.8	7 09.9 -47.8	100.9	1	6 34.0 -47.2	101.4	6 22.1 -47.9	101.5	3	5 46.8 -47.3	102.0	5 34.2 -47.9	102.1	3
2	7 43.1 -43.2	100.7	7 31.9 -43.9	100.8	7 20.5 -44.5	100.9	7 09.1 -45.3	101.1	6 57.5 -45.9	101.2	6 45.8 -46.6	101.3	6 34.0 -47.2	101.4	6 22.1 -47.9	101.5	2	5 34.0 -47.2	101.4	6 22.1 -47.9	101.5	2	5 46.8 -47.3	102.0	5 34.2 -47.9	102.1	3
3	6 59.9 -43.2	101.4	6 48.0 -43.9	101.5	6 36.0 -44.6	101.6	6 23.8 -45.3	101.7	6 11.6 -46.0	101.8	5 59.2 -46.6	101.9	5 46.8 -47.3	102.0	5 12.6 -46.7	102.6	4	5 59.5 -47.3	102.7	4 46.3 -47.9	102.7	4	5 46.8 -47.3	102.7	4 46.3 -47.9	102.7	4
4	6 16.7 -43.3	102.1	0 41.1 -44.0	102.2	5 51.4 -44.7	102.3	5 38.5 -45.3	102.4	5 25.6 -46.0	102.5	5 12.6 -46.7	102.6	4 46.3 -47.3	102.7	4 46.3 -47.3	102.7	4	4 46.3 -47.3	102.7	4 46.3 -47.3	102.7	4	4 46.3 -47.3	102.7	4 46.3 -47.3	102.7	4
5	5 33.4 -43.3	102.8	5 20.1 -44.0	102.9	5 06.7 -44.7	103.0	4 53.2 -45.4	103.0	4 39.6 -46.1	103.1	4 25.9 -46.7	103.2	4 12.2 -47.3	103.3	3 58.4 -48.0	103.3	5	3 24.9 -47.4	103.9	3 10.4 -47.9	103.9	6	3 27.5 -47.4	104.5	2 22.5 -48.0	104.5	7
6	4 50.1 -43.4	103.5	4 36.1 -44.1	103.6	4 22.0 -44.8	103.6	4 07.8 -45.4	103.7	3 53.5 -46.0	103.8	3 39.2 -46.7	103.8	3 04.8 -47.4	104.5	2 27.5 -48.0	104.5	6	2 37.5 -47.4	104.5	2 22.5 -48.0	104.5	7	2 37.5 -47.4	104.5	2 22.5 -48.0	104.5	7
7	4 06.7 -43.4	104.2	3 52.0 -44.1	104.2	3 37.2 -44.8	104.3	3 22.4 -45.5	104.4	3 07.5 -46.1	104.4	2 52.5 -46.7	104.5	2 37.5 -47.4	104.5	1 50.1 -47.4	105.1	1	1 50.1 -47.4	105.1	1 34.5 -48.0	105.1	8	1 50.1 -47.4	105.1	1 34.5 -48.0	105.1	8
8	3 23.3 -43.4	104.9	3 07.9 -44.1	104.9	2 52.4 -44.6	105.0	2 36.9 -45.4	105.0	2 21.4 -46.2	105.0	2 05.8 -46.3	105.1	1 35.2 -46.1	105.7	1 19.0 -46.8	105.7	1	1 02.7 -47.3	105.7	0 46.5 -48.0	105.7	9	0 46.5 -48.0	105.7	0 46.5 -48.0	105.7	9
9	2 39.9 -43.5	105.5	2 23.8 -44.2	105.6	2 07.6 -44.8	105.6	1 51.5 -45.5	105.7	1 06.0 -45.5	106.3	0 49.1 -46.1	106.3	0 32.2 -46.7	106.3	0 15.4 -47.4	106.3	0	0 15.4 -47.4	106.3	0 32.0 -47.4	106.3	10	0 15.4 -47.4	106.3	0 32.0 -47.4	106.3	10
10	1 56.4 -43.4	106.2	1 39.6 -44.1	106.3	1 22.8 -44.8	106.3	1 06.0 -45.5	106.3	0 49.1 -46.1	106.3	0 30.0 -46.2	107.0	0 03.0 -46.2	107.0	0 14.5 +46.8	73.0	0	0 14.5 +46.8	73.0	0 32.0 +47.4	73.0	0	0 49.5 +48.0	73.1	0 37.5 +48.0	72.5	12
11	1 13.0 -43.5	106.9	0 55.5 -44.2	106.9	0 38.0 -44.9	107.0	0 20.5 -45.5	107.0	0 03.0 -46.2	107.0	0 14.5 +46.8	73.0	0 32.0 +47.4	73.0	1 19.4 +46.8	72.4	1	1 19.4 +46.8	72.4	1 37.5 +48.0	72.5	12	2 25.5 +48.0	71.9	2 25.5 +48.0	71.9	13
12	0 29.5 -43.5	107.6	0 11.3 -44.2	107.6	0 06.9 +44.8	72.4	0 28.4 +45.5	72.4	0 43.2 +46.1	72.4	1 01.3 +46.8	72.4	1 19.4 +46.8	72.4	2 25.5 +48.0	71.9	2 25.5 +48.0	71.9	13	2 25.5 +48.0	71.9	2 25.5 +48.0	71.9	13			
13	0 14.0 +43.5	71.7	0 32.9 +44.1	71.7	0 51.7 +44.8	71.7	1 10.5 +45.5	71.7	1 29.3 +46.1	71.8	1 48.1 +46.7	71.8	2 15.4 +46.1	71.1	2 34.8 +46.8	71.2	2 54.2 +47.3	71.2	3 13.5 +48.0	71.2	3 13.5 +48.0	71.2	14				
14	0 57.5 +43.5	71.0	1 17.0 +44.2	71.0	1 36.5 +44.8	71.0	1 56.0 +45.5	71.1	2 15.4 +46.1	71.1	2 34.8 +46.8	71.2	2 54.2 +47.3	71.2	3 13.5 +48.0	71.2	3 13.5 +48.0	71.2	14	3 13.5 +48.0	71.2	3 13.5 +48.0	71.2	14			
15	1 41.0 +43.4	70.3	2 01.2 +44.1	70.3	2 21.3 +44.8	70.4	2 41.5 +45.4	70.4	3 01.5 +46.1	70.5	3 21.6 +46.7	70.5	3 41.5 +47.4	70.6	4 01.5 +47.9	70.6	4 01.5 +47.9	70.6	15	4 01.5 +47.9	70.6	4 01.5 +47.9	70.6	15			
16	2 24.4 +43.5	69.6	2 45.3 +44.1	69.7	3 06.1 +44.8	69.7	3 26.9 +45.4	69.8	3 47.6 +46.1	69.8	4 08.3 +46.6	69.9	4 28.9 +47.3	70.0	4 49.4 +47.9	70.0	4 49.4 +47.9	70.0	16	5 16.2 +47.2	69.3	5 37.3 +47.8	69.4	17			
17	3 07.9 +43.4	68.9	3 29.4 +44.1	69.1	3 50.9 +44.7	69.1	4 12.3 +45.4	69.1	4 33.7 +46.0	69.2	4 54.9 +46.7	69.3	5 16.2 +47.2	69.3	5 37.3 +47.8	69.4	5 37.3 +47.8	69.4	17	5 16.2 +47.2	69.3	5 37.3 +47.8	69.4	17			
18	3 51.3 +43.4	68.2	4 13.5 +44.0	68.3	4 35.6 +44.7	68.4	4 57.7 +45.3	68.5	5 19.7 +46.0	68.5	5 41.6 +46.6	68.6	6 03.4 +47.2	68.0	6 28.2 +46.6	68.0	6 50.6 +47.2	68.1	7 12.9 +47.8	68.2	7 12.9 +47.8	68.2	19				
19	4 34.7 +43.3	67.6	4 57.5 +44.0	67.6	5 20.3 +44.7	67.7	5 43.0 +45.4	67.8	6 05.7 +45.9	67.9	6 28.4 +46.5	67.9	7 14.8 +46.5	67.4	7 37.8 +47.1	67.5	8 00.7 +47.7	67.6	8 00.7 +47.7	67.6	20						
20	5 18.0 +43.3	66.9	5 41.5 +44.0	66.9	6 05.0 +44.6	67.0	6 28.4 +45.2	67.1	6 51.6 +45.9	67.3	7 14.8 +46.5	67.4	7 37.8 +47.1	67.5	8 00.7 +47.7	67.6	8 00.7 +47.7	67.6	20	8 00.7 +47.7	67.6	8 00.7 +47.7	67.6	20			
21	6 01.3 +43.2	66.2	6 25.5 +43.9	66.3	6 49.6 +44.6	66.4	7 13.6 +45.2	66.5	7 37.5 +45.8	66.6	8 01.3 +46.4	66.7	8 24.9 +47.0	66.9	8 48.4 +47.7	67.0	9 36.1 +47.5	66.4	9 36.1 +47.5	66.4	21						
22	6 44.5 +43.2	65.5	7 09.4 +43.8	65.6	7 34.2 +44.4	65.7	7 58.8 +45.1	65.8	8 23.3 +45.8	65.9	8 47.7 +46.4	66.1	9 11.9 +47.0	66.2	9 36.1 +47.5	66.4	9 36.1 +47.5	66.4	22	9 36.1 +47.5	66.4	9 36.1 +47.5	66.4	22			
23	7 27.7 +43.1	64.8	7 53.2 +43.8	64.9	8 18.6 +44.5	65.0	8 43.9 +45.1	65.2	9 09.1 +45.7	65.3	9 34.1 +46.3	65.4	9 58.9 +46.9	66.5	10 23.6 +47.6	65.8	10 45.8 +46.9	66.5	10 45.8 +46.9	66.5	23						
24	8 10.8 +43.1	64.1	8 37.0 +43.7	64.2	9 03.1 +44.3	64.3	9 29.0 +45.0	64.5	9 54.8 +45.6	64.6	10 20.4 +46.2	64.8	10 45.8 +46.9	65.1	11 11.2 +47.4	65.1	11 11.2 +47.4	65.1	24	11 11.2 +47.4	65.1	11 11.2 +47.4	65.1	24			
25	8 53.9 +42.9	63.4	9 20.7 +43.6	63.5	9 47.4 +44.3	63.7	10 14.0 +44.9	63.8	10 40.4 +45.5	64.0	14 27.0 +45.0	64.6	14 56.4 +46.2	64.2	11 32.7 +46.7	64.3	11 58.6 +47.3	64.5	11 58.6 +47.3	64.5	25						
26	9 36.8 +42.9	62.8	10 31.7 +44.1	63.0	10 58.9 +44.8	63.1	11 25.9 +45.2	63.3	11 52.4 +46.0	63.5	12 19.4 +46.7	63.7	12 45.9 +47.3	63.9	13 27.7 +47.2	63.3	13 33.2 +47.2	63.3	13 33.2 +47.2	63.3	27						
27	10 19.7 +42.8	61.9	10 47.9 +43.4	62.1	11 15.8 +44.8	62.3	11 43.7 +44.7	62.5	12 11.3 +45.4	62.6	12 38.8 +46.0	62.8	13 06.1 +46.6	63.0	13 33.2 +47.2	63.3	13 33.2 +47.2	63.3	27	13 33.2 +47.2	63.3	13 33.2 +47.2	63.3	27			
28	11 02.5 +42.7	61.2	11 31.3 +43.3	61.4	11 59.9 +44.0	61.6	12 28.4 +44.6	61.8	12 56.7 +45.2	62.0	13 24.8 +45.8	62.2	13 52.7 +46.4	62.4	14 20.4 +47.0	62.6	14 41.1 +46.7	62.6	14 41.1 +46.7	62.6	28						
29	11 45.2 +42.6	60.5	12 22.8 +43.2	60.7	12 43.9 +44.3	60.9	13 32.0 +39.6	61.3	13 51.3 +40.2	64.0	14 58.4 +40.8	64.4	15 30.4 +40.7	64.4	16 21.4 +41.4	64.4	16 41.1 +44.4	64.4	16 41.1 +44.4	64.4	29						
30	12 24.8 +40.8	59.4	13 20.7 +41.2	59.5	13 47.8 +42.2	59.6	14 21.8 +42.8	59.7	15 21.6 +43.2	59.8	16 47.6 +44.6	59.8	17 12.9 +45.2	59.8	17 43.8 +45.9	59.1	18 14.5 +46.5	59.4	18 14.5 +46.5	59.4	30						
31	13 58.7 +40.8	58.1	14 27.0 +41.2	58.2	14 48.4 +39.0																						

78°, 282° L.H.A.

LATITUDE SAME NAME AS DECLINATION

{ L.H.A. greater than 180°Zn=Z
N. Lat. { L.H.A. less than 180°Zn=360°-Z }

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			Dec.								
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z									
0	8	27.2	+42.9	98.5	8	18.2	+43.6	98.7	8	09.1	+44.3	98.8	7	59.8	+45.0	99.0	7	50.4	+45.7	99.1	7	40.8	+46.4	99.2	7	31.1	+47.0	99.4	7	21.3	+47.6	99.5	0
1	9	10.1	+42.8	97.8	9	01.8	+43.5	98.0	8	53.4	+44.2	98.2	8	44.8	+44.9	98.3	8	36.1	+45.6	98.5	8	27.2	+46.2	98.6	8	18.1	+47.0	98.8	8	08.9	+47.6	98.9	1
2	9	52.9	+42.6	97.1	9	45.3	+43.4	97.3	9	37.6	+44.2	97.5	9	29.7	+44.9	97.6	9	21.7	+45.5	97.8	9	13.4	+46.3	98.0	9	05.1	+46.8	98.1	8	56.5	+47.5	98.3	2
3	10	35.5	+42.6	96.4	10	28.7	+43.4	96.6	10	21.8	+44.0	96.8	10	14.6	+44.7	97.0	10	07.2	+45.5	97.1	9	59.7	+46.1	97.3	9	51.9	+46.8	97.5	9	44.0	+47.5	97.7	3
4	11	18.1	+42.5	95.7	11	12.1	+43.2	95.9	11	05.8	+44.0	96.1	10	59.3	+44.7	96.3	10	52.7	+45.3	96.5	10	45.8	+46.1	96.7	10	38.7	+46.8	96.9	10	31.5	+47.4	97.0	4
5	12	00.6	+42.4	95.0	11	55.3	+43.1	95.2	11	49.8	+43.8	95.4	11	44.0	+44.6	95.6	11	38.0	+45.3	95.8	11	31.9	+45.9	96.0	11	25.5	+46.6	96.2	11	18.9	+47.3	96.4	5
6	12	43.0	+42.2	94.3	12	38.4	+43.0	94.5	12	33.6	+43.8	94.7	12	28.6	+44.5	94.9	12	23.3	+45.2	95.1	12	17.8	+45.9	95.4	12	12.1	+46.6	95.6	12	06.2	+47.2	95.8	6
7	13	25.2	+42.1	93.5	13	21.4	+42.9	93.8	13	17.4	+43.6	94.0	13	13.1	+44.3	94.2	13	08.5	+45.1	94.4	13	03.7	+45.3	94.7	12	58.7	+46.4	94.9	12	53.4	+47.1	95.2	7
8	14	07.3	+42.0	92.8	14	04.3	+42.8	93.0	14	01.0	+43.5	93.3	13	57.4	+44.3	93.5	13	53.6	+44.9	93.8	13	49.5	+45.7	94.0	13	45.1	+46.4	94.3	13	40.5	+47.1	94.5	8
9	14	49.3	+41.9	92.1	14	47.1	+42.6	92.3	14	44.5	+43.4	92.6	14	41.7	+44.1	92.8	14	38.5	+44.9	93.1	14	35.2	+45.5	93.4	14	31.5	+46.3	93.6	14	27.6	+46.9	93.9	9
10	15	31.2	+41.7	91.3	15	29.7	+42.4	91.6	15	27.9	+43.2	91.9	15	25.8	+44.0	92.1	15	23.4	+44.7	92.4	15	20.7	+45.4	92.7	15	17.8	+46.1	93.0	15	14.5	+46.8	93.2	10
11	16	12.9	+41.5	90.6	16	12.1	+42.4	90.9	16	11.1	+43.1	91.1	16	09.8	+43.8	91.4	16	08.1	+44.6	91.7	16	06.1	+45.3	92.0	16	03.9	+46.0	92.3	16	01.3	+46.7	92.6	11
12	16	54.4	+41.4	89.8	16	54.5	+42.1	90.1	16	54.2	+42.9	90.4	16	53.6	+43.7	90.7	16	52.7	+44.4	91.0	16	51.4	+45.9	91.6	16	48.0	+46.6	91.9	16				
13	17	35.8	+41.2	89.0	17	36.6	+42.0	89.4	17	37.1	+42.8	89.7	17	37.3	+43.5	90.0	17	37.1	+44.3	90.3	17	36.6	+45.0	90.6	17	35.8	+45.7	91.0	17	34.6	+46.5	91.3	13
14	18	17.0	+41.0	88.3	18	18.6	+41.8	88.6	18	19.9	+42.6	88.9	18	20.8	+43.4	89.3	18	21.4	+44.1	89.6	18	21.6	+44.9	89.9	18	21.5	+45.6	90.3	18	21.1	+46.3	90.6	14
15	18	58.0	+40.8	87.5	19	00.4	+41.7	87.9	19	02.5	+42.4	88.2	19	04.2	+43.2	88.5	19	05.5	+44.0	88.8	19	06.5	+44.7	89.2	19	07.1	+45.5	89.6	19	07.4	+46.1	89.9	15
16	19	38.8	+40.6	86.7	19	42.1	+41.4	87.1	19	44.9	+42.2	87.5	19	47.4	+43.0	87.8	19	49.5	+43.8	88.2	19	51.2	+44.5	88.5	19	53.5	+46.0	88.9	16				
17	20	19.4	+40.5	86.0	20	23.5	+41.2	86.3	20	27.1	+42.1	86.7	20	30.4	+42.8	87.1	20	33.3	+43.6	87.4	20	35.7	+44.1	87.8	20	37.8	+45.1	88.2	20	39.5	+45.9	88.6	17
18	20	59.9	+40.1	85.2	21	04.7	+41.0	85.5	21	09.2	+41.8	85.9	21	13.2	+42.6	86.3	21	16.9	+43.4	86.7	21	20.1	+44.2	87.1	21	22.9	+45.0	87.5	21	25.4	+45.6	87.9	18
19	21	40.0	+40.0	84.4	21	45.7	+40.8	84.8	21	51.0	+41.6	85.2	21	55.8	+42.5	85.6	22	00.3	+43.2	86.0	22	04.3	+44.0	86.4	22	07.9	+44.7	86.8	22	11.0	+45.5	87.2	19
20	22	20.0	+39.7	83.6	22	26.5	+40.6	84.0	22	32.6	+41.4	84.4	22	38.3	+42.1	84.8	22	43.5	+43.0	85.2	22	48.3	+43.7	85.6	22	52.6	+44.6	86.1	22	56.5	+45.3	86.5	20
21	22	59.7	+39.5	82.8	23	07.1	+40.3	83.2	23	14.0	+41.1	83.6	23	20.4	+42.0	84.0	23	26.5	+42.7	84.5	23	32.0	+43.6	84.9	23	37.2	+44.3	85.3	23	41.8	+45.1	85.8	21
22	23	39.2	+39.2	81.9	23	47.4	+40.0	82.4	23	55.1	+40.9	82.8	24	02.4	+41.7	83.2	24	09.2	+42.6	83.7	24	15.6	+43.3	84.1	24	21.5	+44.1	84.6	24	26.9	+44.9	85.0	22
23	24	18.4	+38.9	81.1	24	27.4	+39.8	81.6	24	36.0	+40.7	82.0	24	44.1	+41.5	82.5	24	51.8	+42.3	82.9	24	58.9	+43.1	83.4	25	11.8	+44.7	84.3	23				
24	24	57.3	+38.7	80.3	25	07.2	+39.5	80.7	25	16.7	+40.3	81.2	25	25.6	+41.2	81.7	25	34.1	+42.0	82.1	25	42.0	+42.9	82.6	25	49.5	+43.7	83.1	25	56.5	+44.4	83.6	24
25	25	36.0	+38.3	79.4	25	46.7	+39.3	79.9	25	57.0	+40.1	80.4	26	06.8	+41.0	80.9	26	16.1	+41.8	81.3	26	24.9	+42.6	81.8	26	33.2	+43.4	82.3	26	40.9	+44.2	82.8	25
26	26	14.3	+38.1	78.6	26	26.0	+38.9	79.0	26	37.1	+39.8	79.5	26	47.8	+40.6	80.0	26	57.9	+41.5	80.5	27	07.5	+42.3	81.0	27	16.6	+43.1	81.5	27	25.1	+44.0	82.1	26
27	26	52.4	+37.7	77.7	27	04.9	+38.6	78.2	27	16.9	+39.5	78.7	27	28.4	+40.4	79.2	27	39.4	+41.2	79.7	27	49.8	+42.1	80.2	27	57.9	+42.9	80.8	28	09.1	+43.7	81.3	27
28	27	30.1	+37.4	76.8	27	43.5	+38.3	77.3	27	56.4	+39.2	77.9	28	08.8	+40.0	78.4	28	20.6	+40.9	78.9	28	31.9	+41.7	79.4	28	42.6	+42.6	80.0	28	52.8	+43.4	80.5	28
29	28	07.5	+37.0	75.9	28	21.8	+38.0	76.5	28	35.6	+38.7	77.0	28	48.8	+39.7	77.5	29	01.5	+40.6	78.1	29	13.6	+41.5	78.6	29	25.2	+42.3	79.2	29	36.2	+43.1	79.7	29
30	28	44.5	+36.7	75.0	28	59.8	+37.6	75.6	29	14.4	+38.5	76.1	29	28.5	+39.4	76.7	29	42.1	+40.3	77.2	29	55.1	+41.1	77.8	30	07.5	+42.0	78.3	30	19.3	+42.9	78.9	30
31	29	21.2	+36.4	74.1	29	37.4	+37.2	74.7	29	52.9	+38.2	75.2	30	07.9	+39.1	75.8	30	22.4	+39.9	76.4	30	43.6	+41.7	77.5	31	02.2	+42.5	78.1	31				
32	29	57.6	+35.9	73.2	30	14.6	+36.9	73.8	30	31.1	+37.8	74.3	30	47.0	+38.7	74.9	31	02.3	+39.6	75.5	31	17.0	+40.5	76.1	31	31.2	+41.3	76.7	31	44.7	+42.2	77.3	32
33	30	33.5	+35.5	72.3	31	51.5	+36.4	72.9	31	08.9	+37.3	73.4	31	25.7	+38.3	74.0	31	41.9	+39.2	74.6	31	57.5	+40.2	75.2	32	12.5	+41.0	75.8	32	26.9	+41.8	76.4	33
34																																	

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 78° , 282°

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			Dec.								
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z									
0	8	27.2	-42.9	98.5	8	18.2	-43.6	98.7	8	09.1	-44.4	98.8	7	59.8	-45.0	99.0	7	50.4	-45.8	99.1	7	40.8	-46.4	99.2	7	31.1	-47.1	99.4	7	21.3	-47.7	99.5	0
1	7	44.3	-43.0	99.3	7	34.6	-43.7	99.4	7	24.7	-44.4	99.5	7	14.8	-45.2	99.6	7	04.6	-45.7	99.8	6	54.4	-46.5	99.9	6	44.0	-47.1	100.0	6	33.6	-47.8	100.1	1
2	7	01.3	-43.0	100.0	6	50.9	-43.8	100.1	6	40.3	-44.5	100.2	6	29.6	-45.1	100.3	6	18.9	-45.9	100.4	6	07.9	-46.5	100.5	5	56.9	-47.1	100.6	5	45.8	-47.8	100.7	3
3	6	18.3	-43.2	100.7	6	07.1	-43.8	100.8	5	55.8	-44.5	100.9	5	44.5	-45.2	101.0	5	33.0	-45.9	101.1	5	21.4	-46.5	101.2	5	09.8	-47.2	101.2	4	58.0	-47.8	101.3	3
4	5	35.1	-43.1	101.4	5	23.3	-43.9	101.5	5	11.3	-44.1	101.5	4	59.3	-45.3	101.6	4	47.1	-45.9	101.7	4	34.9	-46.4	101.8	4	22.6	-47.2	101.9	4	10.2	-47.8	101.9	4
5	4	52.0	-43.2	102.1	4	39.4	-43.9	102.1	4	26.7	-44.6	102.2	4	14.0	-45.3	102.3	4	01.2	-45.9	102.4	3	48.3	-46.6	102.4	3	35.4	-47.3	102.5	3	22.4	-47.9	102.5	5
6	4	08.8	-43.3	102.8	3	55.5	-44.0	102.8	3	42.1	-44.6	102.9	3	28.7	-45.3	102.9	3	15.3	-46.0	103.0	3	01.7	-46.6	103.1	2	34.5	-47.9	103.2	6				
7	3	25.5	-43.3	103.4	3	11.5	-43.9	103.5	2	57.5	-44.7	103.6	2	43.4	-45.3	103.6	2	29.3	-46.0	103.6	2	15.1	-46.6	103.7	2	00.9	-47.3	103.7	7				
8	2	42.2	-43.3	104.1	2	27.6	-44.0	104.2	2	12.8	-44.7	104.2	1	58.1	-45.4	104.3	1	43.3	-46.0	104.3	1	13.6	-47.3	104.3	0	58.7	-47.9	104.4	8				
9	1	58.9	-43.3	104.8	1	43.6	-44.1	104.9	1	28.2	-44.7	104.9	1	12.7	-45.3	104.9	0	57.3	-46.0	104.9	0	41.8	-46.6	104.9	0	10.8	-47.9	105.0	9				
10	1	15.6	-43.3	105.5	0	59.5	-44.0	105.5	0	43.5	-44.7	105.6	0	27.4	-45.4	105.6	0	11.3	-46.1	105.6	0	04.8	-46.7	74.4	0	37.1	+47.8	74.4	10				
11	0	32.3	-43.3	106.2	0	15.5	-44.0	106.2	0	01.2	+44.7	73.8	0	18.0	+45.4	73.8	0	34.8	+46.0	73.8	0	51.5	+46.7	73.8	1	08.2	+47.3	73.8	11				
12	0	11.0	+43.4	73.1	0	28.5	+44.0	73.1	0	45.9	+44.7	73.1	1	03.4	+45.3	73.1	1	20.8	+46.0	73.1	1	38.2	+46.6	73.2	2	12.8	+47.3	73.2	12				
13	0	54.4	+43.3	72.4	1	12.5	+44.0	72.4	1	30.6	+44.7	72.4	1	48.7	+45.3	72.5	2	06.8	+46.0	72.5	2	24.8	+46.6	72.5	3	30.0	+47.2	72.6	13				
14	1	37.7	+43.3	71.7	1	56.5	+44.0	71.7	2	15.3	+44.7	71.8	2	34.0	+45.4	71.8	2	52.8	+45.9	71.9	3	11.4	+46.6	71.9	3	30.0	+47.2	72.0	14				
15	2	21.0	+43.3	71.0	2	40.5	+44.0	71.1	3	00.0	+44.6	71.1	3	19.4	+45.3	71.2	3	38.7	+46.0	71.2	3	58.0	+46.6	71.3	4	17.2	+47.2	71.3	15				
16	3	04.3	+43.3	70.3	3	24.5	+43.9	70.4	3	44.6	+44.6	70.4	4	04.7	+45.2	70.5	4	24.7	+45.9	70.6	4	44.6	+46.5	70.6	5	04.4	+47.2	70.7	16				
17	3	47.6	+43.2	69.6	4	08.4	+43.9	69.7	4	29.2	+44.6	69.8	4	49.9	+45.2	69.8	5	10.6	+45.5	69.9	5	31.1	+46.5	70.0	5	51.6	+47.1	70.1	17				
18	4	30.8	+43.2	68.9	5	52.3	+43.9	69.0	5	13.8	+44.5	69.1	5	35.1	+45.2	69.2	5	56.4	+45.8	69.3	6	17.6	+46.4	69.4	6	38.7	+47.0	69.5	6				
19	5	14.0	+43.1	68.2	5	36.2	+43.8	68.3	5	58.3	+44.5	68.4	6	20.3	+45.1	68.5	6	42.2	+45.8	68.6	7	04.0	+46.4	68.7	7	25.7	+47.1	68.9	7				
20	5	57.1	+43.1	67.5	6	20.0	+43.8	67.6	6	42.8	+44.4	67.7	7	05.4	+45.1	67.9	7	28.0	+45.7	68.0	7	50.4	+46.4	68.1	8	12.8	+46.9	68.2	8				
21	6	40.2	+43.0	66.8	7	03.8	+43.7	66.9	7	27.2	+44.6	67.1	7	50.5	+45.0	67.2	8	13.7	+45.7	67.3	8	36.8	+46.3	67.5	8	59.7	+46.9	67.6	9				
22	7	23.2	+43.0	66.1	7	47.5	+43.6	66.3	8	11.6	+44.2	66.4	8	35.5	+45.0	66.5	8	59.4	+45.5	66.6	9	23.1	+46.2	66.8	9	46.6	+46.8	67.0	10				
23	8	06.2	+42.9	65.4	8	31.1	+43.5	65.6	8	55.8	+44.3	65.7	9	20.5	+44.8	65.8	10	09.3	+46.1	66.0	10	33.4	+46.8	66.3	10	57.4	+47.4	66.5	23				
24	9	49.1	+42.8	64.7	9	14.6	+43.5	64.9	9	40.1	+44.1	65.0	10	05.3	+44.8	65.2	10	30.4	+45.4	65.3	11	20.2	+46.6	65.5	11	44.8	+47.2	65.9	24				
25	9	31.9	+42.7	64.0	9	58.1	+43.4	64.2	10	24.2	+44.0	64.3	10	50.1	+44.7	64.5	11	15.8	+45.4	64.7	11	41.4	+46.0	64.9	12	06.8	+46.6	65.1	25				
26	10	14.6	+42.7	63.3	10	41.5	+43.3	63.5	11	08.2	+44.0	63.6	11	34.8	+44.6	63.8	12	01.2	+45.2	64.0	12	27.4	+45.8	64.2	12	53.4	+46.5	64.4	13				
27	10	57.3	+42.5	62.6	11	24.8	+43.2	62.8	11	52.2	+43.8	62.9	12	19.4	+44.5	63.1	12	46.4	+45.1	63.3	13	39.9	+46.3	63.5	14	06.3	+47.0	64.0	27				
28	11	39.8	+42.4	61.9	12	08.0	+43.1	62.1	12	36.0	+43.8	62.2	13	03.9	+44.4	62.4	13	31.5	+45.1	62.7	13	59.0	+45.6	62.9	14	26.2	+46.3	63.1	14				
29	12	22.2	+42.3	61.1	12	51.1	+43.0	61.3	13	19.8	+43.6	61.5	13	48.3	+44.2	61.8	14	16.6	+44.9	62.0	15	12.5	+46.1	62.2	15	40.1	+46.8	62.7	29				
30	13	04.5	+42.2	60.4	13	34.1	+42.8	60.6	14	03.4	+43.5	60.8	14	32.5	+44.2	61.1	15	01.5	+44.7	61.3	15	30.2	+45.4	61.5	15	58.6	+46.1	61.8	16				
31	13	46.7	+42.1	59.7	14	16.9	+42.7	59.9	14	46.9	+43.4	60.1	15	16.7	+44.0	60.4	15	46.2	+44.7	60.6	16	15.6	+45.2	60.9	16	44.7	+45.9	61.1	17				
32	14	28.8	+41.9	59.0	15	54.6	+42.6	59.2	15	30.3	+43.2	59.4	16	06.7	+43.7	59.5	16	30.9	+44.5	59.7	17	30.6	+45.7	60.4	18	00.0	+46.4	60.7	32				
33	15	10.7	+41.8	58.2	15	27.5	+41.6	58.4	15	49.2	+42.3	58.6	16	13.5	+43.1	58.7	17	43.9	+44.8	58.9	18	16.3	+45.6	59.8	18	46.4	+46.2	60.0	33				
34	15	52.5	+41.6	57.5	15	42.2	+42.4	57.7	16	56.6	+42.9	58.0	17	28.3	+43.5	58.2	17	59.7	+44.2	58.5	18	31.0	+45.5	58.8	19	01.9	+45.5	59.1	19				
35	16	34.1	+41.4	56.7	17	06.9	+42.1	57.0	17	39.5	+42.7	57.2	18	11.8	+43.4	57.5	18	43.9	+44.1	57.8	19	15.8	+44.7	58.1	19	47.4	+45.3	58.4	20				
36	17	15.5	+41.3	56.0	17	49.0	+41.9	56.2	18	22.2	+42.6	56.5	18	55.2	+43.3	56.8	19	28.0	+43.9	57.1	20	00.5	+44.5	57.4	20	32.7	+45.1	57.7	21				
37	17	56.8	+41.1	55.2	18	30.9	+41.8	55.5	19	04.8	+42.4	55.8	19	38.5	+43.0	56.0	20	11.9	+43.6	56.													

79°, 281° L.H.A.

LATITUDE SAME NAME AS DECLINATION

{ L.H.A. greater than 180°Zn=Z
N. Lat. { L.H.A. less than 180°Zn=360°-Z }

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			Dec.								
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z									
0	7	45.2	+42.8	97.8	7	37.0	+43.5	98.0	7	28.6	+44.3	98.1	7	20.1	+44.9	98.2	7	11.5	+45.6	98.3	7	02.7	+46.3	98.5	6	53.8	+46.9	98.6	6	44.8	+47.6	98.7	0
1	8	28.0	+42.7	97.1	8	20.5	+43.5	97.3	8	12.9	+44.1	97.4	8	05.0	+44.9	97.6	7	57.1	+45.5	97.7	7	49.0	+46.2	97.8	7	40.7	+46.9	98.0	7	32.4	+47.5	98.1	1
2	9	10.7	+42.7	96.4	9	04.0	+43.3	96.6	8	57.0	+44.1	96.7	8	49.9	+44.8	96.9	8	42.6	+45.5	97.0	8	35.2	+46.2	97.2	8	27.6	+46.9	97.3	8	19.9	+47.5	97.5	2
3	9	53.4	+42.5	95.7	9	47.3	+43.3	95.9	9	41.1	+44.0	96.0	9	34.7	+44.7	96.2	9	28.1	+45.4	96.4	9	21.4	+46.1	96.5	9	14.5	+46.7	96.7	9	07.4	+47.4	96.9	3
4	10	35.9	+42.4	95.0	10	25.1	+43.3	95.2	10	19.4	+44.6	95.5	10	13.5	+45.4	95.7	10	07.5	+46.6	95.9	10	01.2	+46.7	96.1	9	54.8	+47.3	96.2	4				
5	11	18.3	+42.3	94.3	11	13.8	+43.0	94.5	11	09.0	+43.8	94.7	11	04.0	+44.6	94.8	10	58.9	+45.2	95.0	10	53.5	+45.9	95.2	10	47.9	+46.6	95.4	10	42.1	+47.3	95.6	5
6	12	00.6	+42.3	93.5	11	56.8	+43.0	93.7	11	52.8	+43.7	94.0	11	48.6	+44.4	94.2	11	44.1	+45.1	94.4	11	39.4	+45.9	94.6	11	34.5	+46.5	94.8	11	29.4	+47.2	95.0	6
7	12	42.9	+42.1	92.8	12	39.8	+42.9	93.0	12	36.5	+43.6	93.3	12	33.0	+44.3	93.5	12	29.2	+45.1	93.7	12	25.3	+45.7	93.9	12	21.0	+46.5	94.1	12	16.6	+47.1	94.4	7
8	13	25.0	+41.9	92.1	13	22.7	+42.7	92.3	13	20.1	+43.5	92.5	13	17.3	+44.2	92.8	13	14.3	+44.9	93.0	13	11.0	+45.5	93.3	13	07.5	+46.3	93.5	13	03.7	+47.0	93.7	8
9	14	06.9	+41.9	91.3	14	05.4	+42.6	91.6	14	03.6	+43.4	91.8	14	01.5	+44.1	92.1	13	59.2	+44.8	92.3	13	56.6	+45.6	92.6	13	53.8	+46.2	92.8	13	50.7	+46.9	93.1	9
10	14	48.8	+41.7	90.6	14	48.0	+42.5	90.9	14	47.0	+43.2	91.1	14	45.6	+44.0	91.4	14	44.0	+44.7	91.7	14	42.2	+45.4	91.9	14	40.0	+46.2	92.2	14	37.6	+46.8	92.4	10
11	15	30.5	+41.5	89.9	15	30.5	+42.3	90.1	15	30.2	+43.1	90.4	15	29.6	+43.8	90.7	15	28.7	+44.6	91.0	15	27.6	+45.3	91.2	15	26.2	+46.0	91.5	15	24.4	+46.7	91.8	11
12	16	12.0	+41.4	89.1	16	12.8	+42.1	89.4	16	13.3	+42.9	89.7	16	13.4	+43.7	90.0	16	13.3	+44.5	90.3	16	12.9	+45.1	90.6	16	12.2	+45.8	90.8	16	11.1	+46.6	91.1	12
13	16	53.4	+41.2	88.3	16	54.9	+42.1	88.7	16	56.2	+42.8	89.0	16	57.1	+43.6	89.3	16	57.8	+44.2	89.6	16	58.0	+45.1	89.9	16	57.7	+46.4	90.5	13				
14	17	34.6	+41.0	87.6	17	37.0	+41.8	87.9	17	39.0	+42.6	88.2	17	40.7	+43.4	88.5	17	42.0	+44.2	88.9	17	43.1	+44.8	89.2	17	43.8	+45.6	89.5	17	44.1	+46.3	89.8	14
15	18	15.6	+40.9	86.8	18	18.8	+41.6	87.1	18	21.6	+42.4	87.5	18	24.1	+43.2	87.8	18	26.2	+44.0	88.1	18	27.9	+44.8	88.5	18	30.4	+46.2	88.9	15				
16	18	56.5	+40.6	86.0	19	00.4	+41.5	86.4	19	04.0	+42.3	86.7	19	07.3	+43.0	87.1	19	10.2	+43.8	87.4	19	12.7	+44.5	87.8	19	14.8	+45.3	88.1	19	16.6	+46.0	88.5	16
17	19	37.1	+40.5	85.3	19	41.9	+41.3	85.6	19	46.3	+42.1	86.0	19	50.3	+42.9	86.3	19	54.0	+43.6	86.7	19	57.2	+44.4	87.1	20	00.1	+45.1	87.4	20	02.6	+45.9	87.8	18
18	20	17.6	+40.2	84.5	20	23.2	+41.0	84.9	20	28.4	+41.8	85.2	20	33.2	+42.6	85.6	20	37.6	+43.4	86.0	20	41.6	+44.2	86.3	20	45.2	+45.0	86.7	20	48.5	+45.7	87.1	18
19	20	57.8	+40.1	83.7	21	04.2	+40.9	84.1	21	10.2	+41.7	84.5	21	15.8	+42.5	84.8	21	21.0	+43.3	85.2	21	25.8	+44.0	86.0	21	34.2	+45.5	86.4	19				
20	21	37.9	+39.8	82.9	21	45.1	+40.6	83.3	21	51.9	+41.4	83.7	21	58.3	+42.2	84.1	22	04.3	+43.0	84.5	22	09.8	+43.8	84.9	22	15.0	+44.5	85.3	22	19.7	+45.3	85.7	20
21	22	17.7	+39.5	82.1	22	25.7	+40.4	82.5	22	33.3	+41.3	82.9	22	40.5	+42.1	83.3	23	47.3	+42.8	83.7	22	53.6	+43.7	84.2	22	59.5	+44.4	84.6	23	05.0	+45.1	85.0	21
22	22	57.2	+39.3	81.3	23	06.1	+40.1	81.7	23	14.6	+40.9	82.1	23	22.6	+41.8	82.5	23	30.1	+42.6	83.0	23	37.3	+43.4	83.4	23	43.9	+44.2	83.8	23	50.1	+45.0	84.3	22
23	23	36.5	+39.0	80.4	23	46.2	+39.9	80.9	23	55.5	+40.8	81.3	24	04.4	+41.5	81.8	24	12.7	+42.4	82.2	24	20.7	+43.1	82.6	24	28.1	+43.9	83.1	24	35.1	+44.7	83.6	23
24	24	15.5	+38.8	79.6	24	26.1	+38.7	80.1	24	36.3	+40.4	80.5	24	55.1	+41.2	81.1	24	65.1	+42.1	81.4	25	03.8	+42.9	81.9	25	12.0	+43.8	82.3	25	19.8	+44.5	82.8	24
25	24	54.3	+38.5	78.8	25	05.8	+39.3	79.2	25	16.7	+40.2	79.7	25	27.2	+41.1	80.2	25	37.2	+41.9	80.6	25	46.7	+42.7	81.1	25	55.8	+43.5	81.6	26	04.3	+44.3	82.1	25
26	25	32.8	+38.2	77.9	25	45.1	+39.0	78.4	25	56.9	+39.3	78.9	26	08.3	+40.7	79.4	26	19.1	+41.8	79.8	26	29.4	+42.4	80.3	26	39.3	+43.2	80.8	26	48.6	+44.0	81.3	26
27	26	11.0	+37.8	77.1	26	24.1	+38.8	77.6	26	36.8	+39.7	78.0	26	49.0	+40.5	78.5	27	00.7	+41.3	79.0	27	11.8	+42.2	79.5	27	22.5	+43.0	80.0	27	32.6	+43.8	80.6	27
28	26	48.8	+37.6	76.2	27	02.9	+38.4	76.7	27	16.5	+39.3	77.2	27	29.5	+40.2	77.7	27	42.0	+41.0	78.2	27	54.0	+41.9	78.7	28	05.5	+42.7	79.3	28	16.4	+43.5	79.8	28
29	27	26.4	+37.2	75.3	27	41.3	+38.1	75.8	27	55.5	+39.0	76.3	28	09.7	+39.8	76.9	28	23.0	+40.8	77.4	28	35.9	+41.5	77.9	28	48.2	+42.4	78.5	28	59.9	+43.2	79.0	29
30	28	03.6	+36.9	74.4	28	19.4	+37.8	75.0	28	34.8	+38.6	75.5	28	49.5	+39.6	76.0	29	03.8	+40.4	76.5	29	17.4	+41.3	77.1	29	30.6	+42.1	77.6	29	43.1	+43.0	78.2	30
31	31	04.3	+34.9	69.8	31	24.7	+35.8	70.4	31	44.5	+36.8	71.0	32	03.7	+37.7	71.6	32	22.4	+38.6	72.2	32	40.4	+39.5	72.8	32	57.9	+40.4	73.4	33	14.7	+41.3	74.0	35
32	31	92.4	+34.5	68.9	32	00.5	+35.5	69.5	32	21.3	+36.4	70.1	32	41.4	+37.3	70.7	33	01.0	+38.2	71.3	33	19.9	+39.2	71.9	33	33.8	+40.0	72.5	33	56.0	+40.9	73.2	36
33	32	13.7	+34.1	67.9	32	36.0	+35.0	68.5	32	57.7	+35.9	69.1	33	18.7	+36.9	69.7	33	39.2	+37.8	70.4	33	59.1	+38.7	71.0	34	18.3	+39.6	71.6	34	36.9	+40.5	72.3	37
34	33																																

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 79° , 281°

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			Dec.								
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z									
0	7	45.2	-42.8	97.8	7	37.0	-43.6	98.0	7	28.6	-44.3	98.1	7	20.1	-45.0	98.2	7	11.5	-45.7	98.3	7	02.7	-46.3	98.5	6	53.8	-47.0	98.6	6	44.8	-47.7	98.7	0
1	7	02.4	-42.9	98.5	6	53.4	-43.6	98.7	6	44.3	-44.3	98.8	6	35.1	-45.0	98.9	6	25.8	-45.7	99.0	6	16.4	-46.4	99.1	6	66.8	-47.0	99.2	5	57.1	-47.6	99.3	1
2	6	19.5	-43.0	99.2	6	09.8	-43.7	99.3	6	00.0	-44.4	99.4	5	50.1	-45.1	99.6	5	40.1	-45.8	99.7	5	30.0	-46.4	99.7	5	19.8	-47.1	99.8	5	09.5	-47.7	99.9	3
3	5	36.5	-43.0	99.9	5	26.1	-43.7	100.0	5	15.6	-44.4	100.1	5	05.0	-45.1	100.2	4	54.3	-45.8	100.3	4	43.6	-46.5	100.4	4	32.7	-47.1	100.5	4	21.8	-47.8	100.5	3
4	4	53.5	-43.1	100.6	4	42.4	-43.8	102.7	4	31.2	-44.5	100.8	4	19.9	-45.2	100.9	4	08.5	-45.8	100.9	3	57.1	-46.5	101.0	3	45.6	-47.1	101.1	3	34.0	-47.7	101.0	4
5	4	10.4	-43.1	101.3	3	58.6	-43.8	101.4	3	46.7	-44.5	101.5	3	34.7	-45.2	101.5	3	22.7	-45.9	101.6	3	10.6	-46.5	101.7	2	58.5	-47.2	101.7	2	46.3	-47.8	101.8	5
6	3	27.3	-43.1	102.0	3	14.8	-43.9	102.1	3	02.2	-44.5	102.1	2	49.5	-45.2	102.2	2	36.8	-45.8	102.2	2	24.1	-46.5	102.3	2	11.3	-47.2	102.3	1	58.5	-47.8	102.4	6
7	2	44.2	-43.2	102.7	2	30.9	-43.8	102.8	2	17.7	-44.5	102.8	2	04.3	-45.2	102.9	1	51.0	-45.9	102.9	1	37.6	-46.6	102.9	1	24.1	-47.1	102.9	1	10.7	-47.8	103.0	7
8	2	01.0	-43.1	103.4	1	47.1	-43.9	103.5	1	33.1	-44.4	103.5	1	19.1	-45.2	103.5	0	5.1	-45.9	103.5	0	51.0	-46.5	103.5	0	37.0	-47.2	103.6	8				
9	1	17.9	-43.2	104.1	1	03.2	-43.9	104.1	0	48.5	-44.5	104.2	0	33.9	-45.3	104.2	0	19.2	-45.9	104.2	0	04.5	-46.6	104.2	0	10.2	-47.2	104.2	0	24.9	-47.8	104.8	9
10	0	34.7	-43.2	104.8	0	19.3	-43.9	104.8	0	04.0	-44.6	104.8	0	11.4	-45.2	75.2	0	26.7	-45.9	75.2	0	42.1	-46.5	75.2	0	57.4	-47.2	75.2	1	12.7	-47.8	75.2	10
11	0	08.5	+43.2	74.5	0	24.6	+43.8	74.5	0	40.6	+44.6	74.5	0	56.6	+45.2	74.5	1	12.6	+45.9	74.5	1	28.6	+46.5	74.6	1	44.6	+47.1	74.6	2	00.5	+47.8	74.6	11
12	0	51.7	+43.2	73.8	1	08.4	+43.8	73.8	1	25.2	+44.5	73.8	1	41.8	+45.3	73.9	1	58.5	+45.9	73.9	2	15.1	+46.6	73.9	2	31.7	+47.2	74.0	12				
13	1	34.9	+43.2	73.1	1	52.3	+43.9	73.1	2	09.7	+44.5	73.2	2	27.1	+45.2	73.2	2	44.4	+45.8	73.2	3	01.7	+46.4	73.3	3	18.9	+47.1	73.3	3	36.0	+47.8	73.4	13
14	2	18.1	+43.1	72.4	2	36.2	+43.8	72.4	2	54.2	+44.6	72.5	3	12.3	+45.1	72.5	3	30.2	+45.9	72.6	3	48.1	+46.5	72.7	4	06.0	+47.1	72.7	4	23.8	+47.7	72.8	14
15	3	01.2	+43.1	71.7	3	20.0	+43.8	71.8	3	38.8	+44.4	71.8	3	57.4	+45.2	71.9	4	16.1	+45.8	72.0	4	34.6	+46.4	72.0	4	53.1	+47.0	72.1	5	11.5	+47.6	72.2	15
16	3	44.3	+43.1	71.0	4	03.8	+43.8	71.1	4	23.4	+44.5	71.2	4	42.6	+45.1	71.2	5	01.9	+45.7	71.3	5	21.0	+46.4	71.4	5	40.1	+47.1	71.5	5	59.1	+47.7	71.6	16
17	4	27.4	+43.1	70.3	4	47.6	+43.7	70.4	5	07.7	+44.4	70.5	5	27.7	+45.2	70.6	5	47.6	+45.7	70.7	6	07.4	+46.4	70.8	6	27.2	+46.9	70.9	6	46.8	+47.6	71.0	17
18	5	10.5	+43.0	69.6	5	31.3	+43.7	69.7	5	52.1	+44.3	69.8	6	12.8	+45.0	69.9	6	33.3	+45.7	70.0	6	53.8	+46.3	70.1	7	14.1	+47.0	70.2	7	34.4	+47.5	70.4	18
19	5	53.5	+42.9	68.9	6	15.0	+43.6	69.0	6	36.4	+44.3	69.1	6	57.8	+44.9	69.2	7	19.0	+45.6	69.4	7	40.1	+46.2	69.5	8	01.1	+46.8	69.6	8	21.9	+47.5	69.7	19
20	6	36.4	+42.9	68.2	6	58.6	+43.6	68.3	7	20.7	+44.3	68.4	7	42.7	+44.9	68.6	8	04.6	+45.9	68.7	8	26.3	+46.2	68.8	8	47.9	+46.8	69.0	9	09.4	+47.4	69.1	20
21	7	19.3	+42.8	67.5	7	42.2	+43.5	67.6	8	05.0	+44.1	67.8	8	27.6	+44.8	67.9	8	50.1	+45.5	68.0	9	12.5	+46.1	68.2	9	34.7	+46.7	68.3	9	56.8	+47.3	68.5	21
22	8	02.1	+42.8	66.8	8	25.7	+43.4	66.9	8	49.1	+44.1	67.1	9	12.4	+44.8	67.2	9	35.6	+45.4	67.4	9	58.6	+46.0	67.5	10	21.4	+46.7	67.7	10	44.1	+47.3	67.9	22
23	9	44.9	+42.7	66.1	9	09.1	+43.4	66.2	9	33.2	+44.0	66.4	9	57.2	+44.7	66.5	10	21.0	+45.3	66.7	10	44.6	+46.0	66.9	11	31.4	+47.2	67.1	11	31.4	+47.2	67.2	23
24	9	27.6	+42.5	65.4	9	52.5	+43.2	65.5	10	17.2	+44.0	65.7	10	41.9	+44.5	65.9	11	06.3	+45.2	66.0	11	30.6	+45.8	66.2	11	54.7	+46.5	66.4	12	18.6	+47.1	66.6	24
25	10	10.1	+42.5	64.7	10	35.7	+43.2	64.8	11	01.2	+43.8	65.0	11	26.4	+44.5	65.2	11	51.5	+45.2	65.4	12	16.4	+45.8	65.6	12	41.2	+46.3	65.8	13	05.7	+47.0	66.0	25
26	10	52.6	+42.4	64.0	11	18.9	+43.1	64.1	11	45.0	+43.7	64.3	12	10.9	+44.4	64.5	12	36.7	+45.0	64.7	13	02.2	+45.7	64.9	13	27.5	+46.3	65.1	13	52.7	+46.9	65.3	26
27	11	35.0	+42.3	63.3	12	02.0	+42.9	63.4	12	28.7	+43.7	63.6	12	55.3	+44.3	63.8	13	21.7	+44.9	64.0	13	47.9	+45.5	64.2	14	13.8	+46.2	64.5	14	39.6	+46.8	64.7	27
28	12	17.3	+42.2	62.5	12	44.9	+42.9	62.7	13	12.4	+43.5	62.9	13	39.6	+44.1	63.1	14	06.6	+44.8	63.3	14	33.4	+45.5	63.6	15	00.0	+46.1	63.8	15	26.4	+46.7	64.0	28
29	12	59.5	+42.0	61.8	13	27.8	+42.7	62.0	13	55.9	+43.2	62.2	14	23.7	+44.1	62.4	14	51.4	+44.7	62.7	15	18.9	+45.3	62.9	16	46.1	+45.9	63.1	16	13.1	+46.5	63.4	29
30	13	41.5	+42.0	61.0	14	10.5	+42.6	61.3	14	39.2	+43.3	61.5	15	07.8	+43.9	61.7	15	36.1	+44.5	62.0	16	04.2	+45.2	62.2	16	32.0	+45.8	62.5	16	59.6	+46.5	62.7	30
31	14	23.5	+41.7	60.3	14	53.1	+42.4	60.5	15	22.5	+43.1	60.8	16	51.7	+43.7	61.0	16	20.6	+44.0	61.3	16	49.4	+45.0	61.5	17	17.8	+45.7	61.8	17	46.1	+46.3	62.1	31
32	15	05.2	+41.7	59.6	15	35.5	+42.3	59.8	16	05.6	+36.0	60.0	16	35.4	+43.7	60.3	17	05.0	+44.3	60.6	17	34.4	+44.9	60.8	18	03.5	+45.6	61.1	18	32.4	+46.1	61.4	32
33	16	45.9	+41.4	58.8	16	17.8	+42.2	59.1	16	48.6	+42.8	59.3	17	23.8	+43.5	59.5	17	49.3	+44.1	59.9	18	19.3	+44.8	60.1	19	18.5	+46.0	60.7	33				
34	17	31.8	+40.8	58.5																													

80°, 280° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180°Zn=Z
L.H.A. less than 180°Zn=360°-Z

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			Dec.
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	
0	7 03.2 +42.7	97.1	6 55.7 +43.4	97.2	6 48.1 +44.1	97.3	6 40.3 +44.9	97.5	6 32.5 +45.5	97.6	6 24.5 +46.2	97.7	6 16.4 +46.9	97.8	6 08.2 +47.6	97.9	6 08.2 +47.6	97.9	0	0	0	0	0	0	
1	7 45.9 +42.6	96.4	7 39.1 +43.4	96.5	7 32.2 +44.1	96.7	7 25.2 +44.8	96.8	7 18.0 +45.5	96.9	7 10.7 +46.2	97.1	7 03.3 +46.9	97.2	6 55.8 +47.4	97.3	6 55.8 +47.4	97.3	1	0	0	0	0	0	
2	8 28.5 +42.6	95.7	8 22.5 +43.3	95.8	8 16.3 +44.1	96.0	8 10.0 +44.8	96.1	8 03.5 +45.5	96.3	7 56.9 +46.1	96.4	7 50.2 +46.7	96.5	7 43.2 +47.5	96.7	7 43.2 +47.5	96.7	2	0	0	0	0	0	
3	9 11.1 +42.5	95.0	9 05.8 +43.3	95.1	9 00.4 +43.9	95.3	8 54.8 +44.6	95.5	8 49.0 +45.3	95.6	8 43.0 +46.1	95.8	8 36.9 +46.7	95.9	8 30.7 +47.3	96.1	8 30.7 +47.3	96.1	3	0	0	0	0	0	
4	9 53.6 +42.4	94.3	9 49.1 +43.1	94.4	9 44.3 +43.9	94.6	9 39.4 +44.6	94.8	9 34.3 +45.3	94.9	9 29.1 +46.0	95.1	9 23.6 +46.7	95.3	9 18.0 +47.4	95.4	9 18.0 +47.4	95.4	4	0	0	0	0	0	
5	10 36.0 +42.3	93.5	10 32.2 +43.0	93.7	10 28.2 +43.8	93.9	10 24.0 +44.5	94.1	10 19.6 +45.2	94.3	10 15.1 +45.9	94.5	10 10.3 +46.6	94.6	10 05.4 +47.2	94.8	10 05.4 +47.2	94.8	5	0	0	0	0	0	
6	11 18.3 +42.2	92.8	11 15.2 +43.0	93.0	11 12.0 +43.7	93.2	11 08.5 +44.4	93.4	11 04.8 +45.1	93.6	11 01.0 +45.8	93.8	10 56.9 +46.5	94.0	10 52.6 +47.1	94.2	10 52.6 +47.1	94.2	6	0	0	0	0	0	
7	12 00.5 +42.1	92.1	11 58.2 +42.8	92.3	11 55.7 +43.5	92.5	11 52.9 +44.3	92.7	11 49.9 +45.1	92.9	11 46.8 +45.7	93.1	11 43.4 +46.4	93.4	11 39.7 +47.1	93.6	11 39.7 +47.1	93.6	7	0	0	0	0	0	
8	12 42.6 +41.9	91.4	12 41.0 +42.7	91.6	12 39.2 +43.5	91.8	12 37.2 +44.2	92.0	12 35.0 +44.9	92.3	12 32.5 +45.5	92.5	12 29.8 +46.3	92.7	12 26.8 +47.0	92.9	12 26.8 +47.0	92.9	8	0	0	0	0	0	
9	13 24.5 +41.8	90.6	13 23.7 +42.6	90.9	13 22.7 +43.3	91.1	13 21.4 +44.1	91.3	13 19.9 +44.8	91.6	13 18.1 +45.5	91.8	13 16.1 +46.2	92.1	13 13.8 +46.9	92.3	13 13.8 +46.9	92.3	9	0	0	0	0	0	
10	14 06.3 +41.7	89.9	14 06.3 +42.5	90.1	14 06.0 +43.3	90.4	14 05.5 +44.0	90.6	14 04.7 +44.7	90.9	14 03.6 +45.4	91.1	14 02.3 +46.1	91.4	14 00.7 +46.8	91.6	14 00.7 +46.8	91.6	10	0	0	0	0	0	
11	14 48.0 +41.6	89.1	14 48.8 +42.3	89.4	14 49.3 +43.0	89.7	14 49.5 +43.8	89.9	14 49.4 +44.6	90.2	14 49.0 +45.3	90.5	14 48.4 +46.0	90.7	14 47.5 +46.7	91.0	14 47.5 +46.7	91.0	11	0	0	0	0	0	
12	15 29.6 +41.4	88.4	15 31.1 +42.2	88.7	15 32.3 +43.0	89.0	15 33.3 +43.7	89.2	15 34.0 +44.4	89.5	15 34.3 +45.2	89.8	15 34.4 +45.9	90.1	15 34.2 +46.5	90.3	15 34.2 +46.5	90.3	12	0	0	0	0	0	
13	16 11.0 +41.2	87.6	16 13.3 +42.0	87.9	16 15.3 +42.8	88.2	16 17.0 +43.6	88.5	16 18.4 +44.3	88.8	16 19.5 +45.0	89.1	16 20.3 +45.7	89.4	16 20.7 +46.5	89.7	16 20.7 +46.5	89.7	13	0	0	0	0	0	
14	16 52.2 +41.1	86.9	16 55.3 +41.9	87.2	16 58.1 +42.6	87.5	17 00.6 +43.4	87.8	17 02.7 +44.1	88.1	17 04.5 +44.9	88.4	17 06.0 +45.6	88.7	17 07.2 +46.3	89.0	17 07.2 +46.3	89.0	14	0	0	0	0	0	
15	17 33.3 +40.9	86.1	17 37.2 +41.7	86.4	17 40.7 +42.5	86.8	17 44.0 +43.2	87.1	17 46.8 +44.0	87.4	17 49.4 +44.7	87.7	17 51.6 +45.5	88.0	17 53.5 +46.2	88.4	17 53.5 +46.2	88.4	15	0	0	0	0	0	
16	18 14.2 +40.7	85.4	18 18.9 +41.5	85.7	18 23.2 +42.3	86.0	18 27.2 +43.1	86.3	18 30.8 +43.9	86.7	18 34.1 +44.6	87.0	18 37.1 +45.3	87.4	18 39.7 +46.0	87.7	18 39.7 +46.0	87.7	16	0	0	0	0	0	
17	18 54.9 +40.5	84.6	19 00.4 +41.3	84.9	19 05.5 +42.1	85.3	19 10.3 +42.9	85.6	19 14.7 +43.6	86.0	19 18.7 +44.4	86.3	19 22.4 +45.2	86.7	19 25.7 +45.9	87.0	19 25.7 +45.9	87.0	17	0	0	0	0	0	
18	19 35.4 +40.3	83.8	19 41.7 +41.1	84.2	19 47.6 +41.9	84.5	19 53.2 +42.7	84.9	19 58.3 +43.5	85.2	20 03.1 +44.3	85.6	20 07.6 +44.9	86.0	20 11.6 +45.7	86.3	20 11.6 +45.7	86.3	18	0	0	0	0	0	
19	20 15.7 +40.1	83.0	20 22.8 +40.9	83.4	20 29.5 +41.8	83.8	20 35.9 +42.5	84.1	20 41.8 +43.3	84.5	20 47.4 +44.0	84.9	20 52.5 +44.8	85.3	20 57.3 +45.6	85.6	20 57.3 +45.6	85.6	19	0	0	0	0	0	
20	20 55.8 +39.9	82.2	21 03.7 +40.7	82.6	21 11.3 +41.5	83.0	21 18.4 +42.3	83.4	21 25.1 +43.1	83.8	21 31.4 +43.9	84.1	21 37.3 +44.7	84.5	21 42.9 +45.3	84.9	21 42.9 +45.3	84.9	20	0	0	0	0	0	
21	21 35.7 +39.6	81.4	21 44.4 +40.5	81.8	21 52.8 +41.3	82.2	22 00.7 +42.1	82.6	22 08.2 +42.9	83.0	22 15.3 +43.7	83.4	22 22.0 +44.4	83.8	22 28.2 +45.2	84.2	22 28.2 +45.2	84.2	21	0	0	0	0	0	
22	22 15.3 +39.4	80.6	22 24.9 +40.2	81.0	22 34.1 +41.0	81.4	22 42.8 +41.9	81.8	22 51.1 +42.7	82.3	22 59.0 +43.4	82.7	23 06.4 +44.2	83.1	23 13.4 +45.0	83.5	23 13.4 +45.0	83.5	22	0	0	0	0	0	
23	22 54.7 +39.2	79.8	23 05.1 +40.0	80.2	23 15.1 +40.8	80.6	23 24.7 +41.6	81.1	23 33.8 +42.4	81.5	23 42.4 +44.1	81.9	23 50.6 +44.1	82.4	23 58.4 +44.8	82.8	23 58.4 +44.8	82.8	23	0	0	0	0	0	
24	23 33.9 +38.8	79.0	23 45.1 +39.8	79.4	23 55.9 +40.6	79.8	24 06.3 +43.4	80.3	24 16.2 +42.2	80.7	24 25.7 +43.0	81.2	24 34.7 +43.8	81.6	24 43.2 +44.5	82.1	24 43.2 +44.5	82.1	24	0	0	0	0	0	
25	24 12.7 +38.6	78.1	24 24.9 +39.4	78.6	24 36.5 +40.3	79.0	24 47.7 +41.1	79.5	24 58.4 +42.0	79.9	25 08.7 +44.7	80.4	25 18.5 +43.5	80.9	25 27.7 +44.4	81.3	25 27.7 +44.4	81.3	25	0	0	0	0	0	
26	24 51.3 +38.4	77.3	25 04.3 +39.2	77.7	25 16.8 +40.1	78.2	25 28.8 +40.9	78.7	25 40.4 +41.7	79.1	25 51.4 +42.6	79.6	26 02.0 +43.3	80.1	26 12.1 +44.1	80.6	26 12.1 +44.1	80.6	26	0	0	0	0	0	
27	25 29.7 +38.0	76.4	25 43.5 +38.9	76.9	25 56.9 +39.7	77.4	26 09.7 +40.6	77.9	26 22.1 +41.4	78.3	26 34.0 +42.2	78.8	26 45.3 +43.1	79.3	26 56.2 +43.9	79.8	26 56.2 +43.9	79.8	27	0	0	0	0	0	
28	26 07.7 +37.7	75.6	26 22.4 +38.6	76.1	26 36.6 +39.5	76.5	26 50.3 +40.3	77.0	27 03.5 +41.2	77.5	27 16.2 +42.0	78.0	27 28.4 +42.8	78.5	27 40.1 +43.6	79.1	27 40.1 +43.6	79.1	28	0	0	0	0	0	
29	26 45.4 +37.4	74.7	27 01.0 +38.3	75.2	27 16.1 +39.1	75.7	27 30.6 +40.0	76.2	27 44.7 +40.8	76.7	27 58.2 +41.7	77.2	28 11.2 +42.5	77.7	28 23.7 +43.3	78.3	28 23.7 +43.3	78.3	29	0	0	0	0	0	
30	27 22.8 +37.1	73.8	27 39.3 +37.9	74.3	27 55.2 +38.8	74.8	28 10.6 +39.7	75.4	28 25.5 +40.6	75.9	28 39.9 +41.4	76.4	28 53.7 +42.3	76.9	29 07.0 +43.1	77.5	29 07.0 +43.1	77.5	30	0	0	0	0	0	
31	27 59.9 +36.7	72.9	28 17.2 +37.6	73.5	28 34.0 +38.5	74.0	28 50.3 +39.4	74.5	29 06.1 +40.2	75.0	29 21.3 +41.7	75.6	29 36.0 +41.9	76.1	29 50.1 +42.7	76.7	29 50.1 +42.7	76.7	31	0	0	0	0	0	
32	28 36.6 +36.3	72.0	28 54.8 +37.3	72.6	29 12.5 +38.2	73.1	29 27.9 +39.0	73.6	29 46.3 +39.9	74.2	30 02.4 +40.7	74.7	30 17.9 +41.6	75.3	30 32.8 +42.5	75.9	30 32.8 +42.5	75.9	32	0	0	0	0	0	
33	29 19.9 +36.0	71.1	29 32.1 +36.9	71.7	29 50.7 +37.7	72.2	30 08.7 +38.7	72.8	30 26.2 +39.6	73.3	30 41.3 +40.5	73.9	30 59.5 +41.3	74.5	31 15.3 +42.1	75.0	31 15.3 +42.1	75.0	33	0	0	0	0	0	
34	29 48.9 +35.6	70.2	30 09.0 +36.5	70.8	30 28.4 +37.5	71.3	30 47.4 +38.3	71.9	31 05.8 +39.2	72.4	31 23.6 +40.0	73.0													

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 80°, 280°

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			Dec.								
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z									
0	7	03.2	-42.8	97.1	6	55.7	-43.5	97.2	6	48.1	-44.2	97.3	6	40.3	-44.9	97.5	6	32.5	-45.6	97.6	6	24.5	-46.3	97.7	6	16.4	-46.9	97.8	6	08.2	-47.5	97.9	0
1	6	20.4	-42.8	97.8	6	12.2	-43.6	97.9	6	03.9	-44.3	98.0	5	55.4	-44.9	98.1	5	46.9	-45.7	98.2	5	38.2	-46.3	98.3	5	29.5	-47.0	98.4	5	20.7	-47.7	98.5	1
2	5	37.6	-42.9	98.5	5	28.6	-43.6	98.6	5	19.6	-44.3	98.7	5	10.5	-45.0	98.8	5	01.2	-45.6	98.9	4	51.9	-46.3	99.0	4	42.5	-47.0	99.1	4	33.0	-47.6	99.1	3
3	4	54.7	-43.0	99.2	4	45.0	-43.6	99.3	4	35.3	-44.4	99.4	4	25.5	-45.1	99.5	4	15.6	-45.8	99.5	4	05.6	-46.4	99.6	3	55.5	-47.0	99.7	3	45.4	-47.7	99.7	3
4	4	11.7	-42.9	99.9	4	01.4	-43.7	100.0	3	50.9	-44.4	100.1	3	10.4	-45.1	100.1	3	29.8	-45.7	100.2	3	19.2	-46.4	100.2	3	08.5	-47.1	100.3	2	25.7	-47.6	100.4	4
5	3	28.8	-43.0	100.6	3	17.7	-43.7	100.7	3	06.5	-44.4	100.7	2	55.3	-45.1	100.8	2	44.1	-45.8	100.8	2	32.8	-46.4	100.9	2	21.4	-47.0	100.9	2	10.1	-47.7	101.0	5
6	2	45.8	-43.1	101.3	2	34.0	-43.8	101.4	2	22.1	-44.4	101.4	2	10.2	-45.1	101.4	1	58.3	-45.8	101.5	1	46.4	-46.5	101.5	1	34.4	-47.1	101.5	1	22.4	-47.8	101.6	6
7	2	02.7	-43.0	102.0	1	50.2	-43.7	102.0	1	37.7	-44.4	102.1	1	25.1	-45.1	102.1	1	12.5	-45.8	102.1	0	59.9	-46.4	102.1	0	47.3	-47.1	102.2	0	34.6	-47.7	102.2	7
8	1	19.7	-43.1	102.7	1	06.5	-43.8	102.7	0	53.3	-44.5	102.8	0	40.0	-45.1	102.8	0	26.7	-45.8	102.8	0	13.5	-46.5	102.8	0	00.2	-47.1	102.8	0	13.1	-47.7	102.8	8
9	0	36.6	-43.0	103.4	0	22.7	-43.7	103.4	0	08.8	-44.4	103.4	0	05.1	+45.2	76.6	0	19.1	+45.7	76.6	0	33.0	+46.4	76.6	0	46.9	+47.1	76.6	1	00.8	+47.7	76.6	9
10	0	06.4	+43.1	75.9	0	21.0	+43.8	75.9	0	35.6	+44.5	75.9	0	50.3	+45.1	75.9	1	04.8	+45.8	75.9	1	19.4	+46.4	76.0	1	34.0	+47.0	76.0	1	48.5	+47.7	76.0	10
11	0	49.5	+43.0	75.2	1	04.8	+43.7	75.2	1	20.1	+44.4	75.2	1	35.4	+45.1	75.3	1	50.6	+45.8	75.3	2	21.0	+47.1	75.4	2	36.2	+47.7	75.4	11				
12	1	32.5	+43.1	74.5	1	48.5	+43.8	74.5	2	04.5	+44.5	74.6	2	10.5	+45.1	74.6	2	36.4	+45.7	74.6	2	52.3	+46.4	74.7	3	23.9	+47.6	74.8	12				
13	2	15.6	+43.0	73.8	2	32.3	+43.7	73.8	2	49.0	+44.3	73.9	3	05.6	+45.0	73.9	3	22.1	+45.8	74.0	3	38.7	+46.3	74.1	3	55.1	+47.0	74.1	13				
14	2	58.6	+43.0	73.1	3	16.0	+43.7	73.2	3	33.3	+44.4	73.2	3	50.6	+45.1	73.3	4	07.9	+45.7	73.3	4	25.0	+46.4	73.4	4	42.1	+47.0	73.5	4	59.1	+47.6	73.6	14
15	3	41.6	+42.9	72.4	3	59.7	+43.6	72.5	4	17.7	+44.3	72.5	4	35.7	+45.0	72.6	4	53.6	+46.6	72.7	5	11.4	+46.3	72.8	5	29.1	+46.9	72.9	5	46.7	+47.6	73.0	15
16	4	24.5	+43.0	71.7	4	43.3	+43.6	71.8	5	02.0	+44.3	71.9	5	20.7	+44.9	72.0	5	39.2	+45.6	72.0	6	13.4	+46.2	72.1	6	16.0	+46.9	72.2	6	34.3	+47.5	72.3	16
17	5	07.5	+42.8	71.0	5	26.9	+43.6	71.1	5	46.3	+44.3	71.2	6	05.6	+45.6	71.3	6	24.8	+45.6	71.4	6	43.9	+46.2	71.5	7	02.9	+46.8	71.6	7	21.8	+47.4	71.7	17
18	5	50.3	+42.8	70.3	6	10.5	+43.5	70.4	6	30.6	+44.2	70.5	6	50.5	+44.9	70.6	7	10.4	+45.5	70.7	7	30.1	+46.2	70.9	7	49.7	+46.8	71.0	8	09.2	+47.4	71.1	18
19	6	33.1	+42.8	69.6	6	54.0	+43.5	69.7	7	14.8	+44.1	69.8	7	35.4	+44.8	69.9	7	55.9	+45.4	70.1	8	16.3	+46.1	70.2	8	36.5	+46.7	70.4	8	56.6	+47.4	70.5	19
20	7	15.9	+42.7	68.9	7	37.5	+43.3	69.0	7	58.9	+44.0	69.1	8	20.2	+44.7	69.3	8	41.3	+45.4	69.4	9	02.4	+46.0	69.6	9	23.2	+46.7	69.7	9	44.0	+47.2	69.9	20
21	7	58.6	+42.6	68.2	8	20.8	+43.4	68.3	8	42.9	+44.0	68.5	9	04.9	+44.7	68.6	9	26.7	+45.3	68.8	9	48.4	+45.9	68.9	10	09.9	+46.6	69.1	10	31.2	+47.2	69.2	21
22	8	41.2	+42.6	67.5	9	04.2	+43.2	67.6	9	26.9	+43.9	67.8	9	49.6	+44.5	67.9	10	12.0	+45.2	68.1	10	34.3	+45.9	68.3	10	56.5	+46.5	68.4	11	18.4	+47.1	68.6	22
23	9	23.8	+42.4	66.8	9	47.4	+43.1	66.9	10	10.8	+43.8	67.1	10	34.1	+44.5	67.2	10	57.2	+45.2	67.4	11	20.2	+45.8	67.6	11	43.0	+46.4	67.8	12	05.5	+47.1	68.0	23
24	10	06.2	+42.6	66.0	10	30.5	+43.1	66.2	10	54.6	+43.8	66.4	11	18.6	+44.4	66.6	11	42.4	+45.0	66.7	12	06.0	+45.6	66.9	12	29.4	+46.3	67.1	12	52.6	+46.9	67.3	24
25	10	48.6	+42.3	65.3	11	13.6	+42.9	65.5	11	38.4	+43.6	65.7	12	03.0	+44.3	65.9	12	27.4	+44.9	66.1	12	51.6	+45.6	66.3	13	15.7	+46.2	66.5	13	39.5	+46.9	66.7	25
26	11	30.9	+42.1	64.6	11	55.6	+42.9	64.8	12	22.0	+43.5	65.0	12	47.3	+44.1	65.2	13	12.3	+44.9	65.4	13	37.2	+45.5	65.6	14	01.9	+46.1	65.8	14	26.4	+46.7	66.1	26
27	12	13.0	+42.1	63.9	13	39.4	+42.7	64.1	13	05.5	+43.4	64.3	13	31.4	+44.1	64.5	13	57.2	+44.7	64.7	14	22.7	+45.4	64.9	14	48.0	+46.0	65.2	15	13.1	+46.6	65.4	27
28	12	55.1	+41.9	63.1	13	22.1	+42.6	63.3	13	48.9	+43.4	63.6	14	15.5	+43.9	63.8	14	41.9	+44.6	64.0	15	08.1	+45.2	64.3	15	34.0	+45.9	64.5	15	59.7	+46.5	64.8	28
29	13	37.0	+41.8	62.4	14	04.7	+42.4	62.6	14	32.3	+43.2	62.9	14	59.4	+43.8	63.1	15	23.9	+42.7	63.2	16	18.3	+44.7	63.4	16	39.9	+45.7	63.6	17	20.7	+46.4	63.8	29
30	14	18.8	+41.6	61.7	14	47.1	+42.4	61.9	15	15.3	+43.0	62.1	15	43.2	+43.7	62.3	16	10.9	+44.4	62.6	16	38.4	+45.0	62.9	17	05.6	+45.6	63.2	17	32.6	+46.2	63.4	30
31	15	00.4	+41.5	60.9	15	29.5	+42.2	61.2	15	58.3	+42.9	61.4	16	26.9	+43.5	61.7	17	23.4	+44.8	62.2	17	51.2	+45.5	62.5	18	18.8	+46.1	62.8	31				
32	15	41.9	+41.4	60.6	16	11.7	+42.0	60.4	16	41.4	+42.7	60.7	17	10.4	+43.0	60.9	17	39.4	+44.1	61.2	18	36.7	+45.3	61.5	19	04.9	+46.0	61.8	20				
33	16	23.3	+41.2	59.4	17	57.7	+42.9	59.5	17	23.9	+43.6	59.7	18	32.3	+43.2	59.9	19	30.5	+43.8	60.5	20	21.2	+45.2	60.8	21	19.0	+45.8	61.4	23				
34	17	04.5	+40.8	57.9	18	17.2	+41.6	58.2	18	48.8	+42.2	58.5	19	20.0	+42.9	58.8	19	51.0	+43.5	59.1	20	21.7	+44.2	59.4	20	52.2							

81°, 279° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180°Zn=Z
L.H.A. less than 180°Zn=360°-Z

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			Dec.
	Hc	d	Z																						
0	6 21.0	+42.7	96.4	6 14.3	+43.4	96.5	6 07.5	+44.1	96.6	6 00.5	+44.8	96.7	5 53.4	+45.5	96.8	5 46.3	+46.1	96.9	5 39.0	+46.8	97.0	5 31.6	+47.5	97.1	0
1	7 03.7	+42.6	95.7	6 57.7	+43.3	95.8	6 51.6	+44.0	95.9	6 45.3	+44.8	96.0	6 38.9	+45.5	96.2	6 32.4	+46.2	96.3	6 25.8	+46.8	96.4	6 19.1	+47.4	96.5	1
2	7 46.3	+42.5	95.0	7 41.0	+43.3	95.1	7 35.6	+44.0	95.2	7 30.1	+44.7	95.4	7 24.4	+45.4	95.5	7 18.6	+46.0	95.6	7 12.6	+46.7	95.8	7 06.5	+47.4	95.9	2
3	8 28.8	+42.5	94.3	8 24.3	+43.2	94.4	8 19.6	+43.9	94.6	8 14.8	+44.6	94.7	8 09.8	+45.3	94.8	8 04.6	+46.0	95.0	7 59.3	+46.7	95.1	7 53.9	+47.3	95.3	3
4	9 11.3	+42.3	93.5	9 07.5	+43.1	93.7	9 03.5	+43.9	93.9	8 59.4	+44.5	94.0	8 55.1	+45.3	94.2	8 50.6	+46.0	94.3	8 46.0	+46.6	94.5	8 41.2	+47.3	94.6	4
5	9 53.6	+42.3	92.8	9 50.6	+43.0	93.0	9 47.4	+43.7	93.2	9 43.9	+44.5	93.3	9 40.4	+45.1	93.5	9 36.6	+45.9	93.7	9 32.6	+46.6	93.9	9 28.5	+47.2	94.0	5
6	10 35.9	+42.2	92.1	10 33.6	+42.9	92.3	10 31.1	+43.7	92.5	10 28.4	+44.4	92.7	10 25.5	+45.1	92.8	10 22.5	+45.7	93.0	10 19.2	+46.5	93.2	10 15.7	+47.2	93.4	6
7	11 18.1	+42.0	91.4	11 16.5	+42.8	91.6	11 14.8	+43.5	91.8	11 12.8	+44.3	92.0	11 10.6	+45.0	92.2	11 08.2	+45.7	92.4	11 05.7	+46.3	92.6	11 02.9	+47.0	92.8	7
8	12 00.1	+42.0	90.7	11 59.3	+42.7	90.9	11 58.3	+43.5	91.1	11 57.1	+44.2	91.3	11 55.6	+44.9	91.5	11 53.9	+45.7	91.7	11 52.0	+46.3	91.9	11 49.9	+47.0	92.1	8
9	12 42.1	+41.8	89.9	12 42.0	+42.6	90.1	12 41.8	+43.3	90.4	12 41.3	+44.1	90.6	12 40.5	+44.8	90.8	12 39.6	+45.5	91.0	12 38.3	+46.2	91.3	12 36.9	+46.9	91.5	9
10	13 23.9	+41.7	89.2	13 24.6	+42.5	89.4	13 25.1	+43.2	89.7	13 25.4	+43.9	89.9	13 25.3	+44.7	90.1	13 25.1	+45.4	90.4	13 24.5	+46.1	90.6	13 23.8	+46.8	90.9	10
11	14 05.6	+41.6	88.4	14 07.1	+42.3	88.7	14 08.3	+43.1	88.9	14 09.3	+43.9	89.2	14 10.0	+44.6	89.5	14 10.5	+45.3	89.7	14 10.6	+46.0	90.0	14 10.6	+46.6	90.2	11
12	14 47.2	+41.4	87.7	14 49.4	+42.2	88.0	14 51.4	+43.0	88.2	14 53.2	+43.7	88.5	14 54.6	+44.4	88.8	14 55.8	+45.1	89.0	14 56.6	+45.9	89.3	14 57.2	+46.6	89.6	12
13	15 28.6	+41.3	86.9	15 31.6	+42.1	87.5	15 34.4	+42.8	87.5	15 36.9	+43.5	87.8	15 39.0	+44.4	88.1	15 40.9	+45.1	88.3	15 42.5	+45.8	88.6	15 43.8	+46.5	88.9	13
14	16 09.9	+41.1	86.2	16 13.7	+41.9	86.5	16 17.2	+42.7	86.8	16 20.4	+43.5	87.1	16 23.4	+44.1	87.4	16 26.0	+44.9	87.7	16 28.3	+45.6	88.0	16 30.3	+46.3	88.2	14
15	16 51.0	+40.9	85.4	16 55.6	+41.7	85.7	16 59.9	+42.5	86.0	17 03.9	+43.2	86.3	17 07.5	+44.1	86.7	17 10.9	+44.7	87.0	17 13.9	+45.5	87.3	17 16.6	+46.2	87.6	15
16	17 31.9	+40.8	84.7	17 37.3	+41.6	85.0	17 42.4	+42.3	85.3	17 47.1	+43.2	85.6	17 51.6	+43.8	85.9	17 55.6	+44.6	86.3	17 59.4	+45.3	86.6	18 02.8	+46.0	86.9	16
17	18 12.7	+40.5	83.9	18 18.9	+41.4	84.2	18 24.7	+42.2	84.6	18 30.3	+42.9	84.9	18 35.4	+43.7	85.2	18 40.2	+44.5	85.6	18 44.7	+45.2	85.9	18 48.8	+45.9	86.2	17
18	18 53.2	+40.4	83.1	19 00.3	+41.1	83.5	19 06.9	+42.0	83.8	19 13.2	+42.8	84.2	19 19.1	+43.6	84.5	19 24.7	+44.3	84.8	19 29.9	+45.0	85.2	19 34.7	+45.8	85.6	18
19	19 33.6	+40.2	82.3	19 41.4	+41.0	82.7	19 48.9	+41.8	83.0	19 56.0	+42.5	83.4	20 02.7	+43.3	83.8	20 09.0	+44.1	84.1	20 14.9	+44.9	84.5	20 20.5	+45.6	84.9	19
20	20 13.8	+40.0	81.5	20 22.4	+40.8	81.9	20 30.7	+41.6	82.3	20 38.5	+42.4	82.7	20 46.0	+43.2	83.0	20 53.1	+43.9	83.4	20 59.8	+44.7	83.8	21 06.1	+45.4	84.2	20
21	20 53.8	+39.7	80.8	21 03.2	+40.6	81.1	21 12.3	+41.3	81.5	21 20.9	+42.2	81.9	21 29.2	+42.9	82.3	21 37.0	+43.8	82.7	21 44.5	+44.5	83.1	21 51.5	+45.2	83.5	21
22	21 33.5	+39.5	79.9	21 43.8	+40.3	80.3	21 53.6	+41.2	80.7	22 03.1	+41.9	81.1	22 12.1	+42.8	81.5	22 20.8	+43.5	81.9	22 29.0	+44.3	82.3	22 36.7	+45.1	82.8	22
23	22 13.0	+39.3	79.1	22 41.4	+40.1	79.5	22 34.8	+40.9	79.9	22 45.0	+41.8	80.4	22 54.9	+42.5	80.8	23 04.3	+43.3	81.2	23 13.3	+44.0	81.6	23 21.8	+44.8	82.0	23
24	22 52.3	+39.0	78.3	23 04.2	+39.8	78.7	23 15.7	+40.7	79.2	23 26.8	+41.5	79.6	23 37.4	+42.3	80.0	23 47.6	+43.1	80.4	23 57.3	+43.9	80.9	24 06.6	+44.7	81.3	24
25	23 31.3	+38.7	77.5	23 44.0	+39.6	77.9	23 56.4	+40.4	78.4	24 08.3	+41.2	78.8	24 19.7	+42.1	79.2	24 30.7	+42.9	79.7	24 41.2	+43.7	80.1	24 51.3	+44.4	80.6	25
26	24 10.0	+38.5	76.7	24 23.6	+39.4	77.1	24 36.8	+40.2	77.5	24 49.5	+41.0	78.0	25 01.8	+41.8	78.4	25 13.6	+42.6	78.9	25 24.9	+43.4	79.4	25 35.7	+44.2	79.8	26
27	24 48.5	+38.2	75.8	25 03.0	+39.0	76.3	25 17.0	+39.9	76.7	25 30.5	+40.7	77.2	25 43.6	+41.5	77.7	25 56.2	+42.3	78.1	26 08.3	+43.1	78.6	26 19.9	+43.9	79.1	27
28	25 26.7	+37.8	75.0	25 42.0	+38.7	75.4	25 56.9	+39.6	75.9	26 11.2	+40.5	76.4	26 25.1	+41.3	76.8	26 38.5	+42.1	77.3	26 51.4	+43.0	77.8	27 03.8	+43.7	78.3	28
29	26 04.5	+37.6	74.1	26 20.7	+38.5	74.6	26 36.5	+39.3	75.1	26 51.7	+40.1	75.5	26 07.4	+41.0	76.0	27 20.6	+41.9	76.5	27 34.4	+42.6	77.0	27 47.5	+43.5	77.6	29
30	26 42.1	+37.3	73.2	26 59.2	+38.1	73.7	27 15.8	+39.0	74.2	27 31.8	+39.9	74.7	27 47.4	+40.7	75.2	28 02.5	+41.5	75.7	28 17.0	+42.4	76.2	28 31.0	+43.2	76.8	30
31	27 19.4	+36.9	72.4	27 37.3	+37.8	72.8	27 54.8	+38.6	73.4	28 11.7	+39.5	73.9	28 28.1	+40.4	74.4	28 44.0	+41.2	74.9	28 59.4	+42.0	75.4	29 14.2	+42.9	76.0	31
32	27 56.3	+36.6	71.5	28 15.1	+37.5	72.0	28 33.4	+38.4	72.5	28 51.2	+39.2	73.0	29 08.5	+40.1	73.5	29 25.2	+41.0	74.1	29 41.4	+41.8	74.6	29 57.1	+42.5	75.2	32
33	28 29.3	+36.2	70.6	28 52.6	+37.1	71.1	29 11.8	+38.0	71.6	29 30.4	+38.9	72.1	29 48.6	+39.7	72.7	30 06.2	+40.5	73.2	30 23.2	+41.4	73.8	30 39.6	+42.3	74.4	33
34	29 09.1	+35.8	69.7	29 29.7	+36.7	70.2	29 49.8	+37.6	70.7	30 09.3	+38.5	71.3	30 28.3	+39.4	71.8	30 46.7	+40.3	72.4	31 04.6	+41.1	72.9	31 21.9	+42.0	73.5	34
35	29 44.9	+35.4	68.7	30 06.4	+36.4	69.3	30 27.4	+37.2	69.8	30 47.8	+38.1	70.4	31 07.7	+39.0	70.9	31 27.0	+39.9	71.5	31 45.7	+40.8	72.1	32 03.9	+41.6	72.7	35
36	30 20.3	+35.1	67.8	30 42.8	+35.9	68.3	31 04.6	+36.9	68.9	31 25.9	+37.8	69.5	31 46.7	+38.7	70.0	32 06.9	+39.5	70.6	32 26.5	+40.4	71.2	32 45.5	+41.3	71.8	36
37	30 55.4	+34.6	66.9	31 18.7	+35.6	67.4	31 41.5	+36.4	68.0	32 03.7	+37.4	68.6	32 25.4	+38.2	69.1	32 46.4	+39.2	69.7	33 06.9	+40.0					

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 81°, 279°

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			Dec.								
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z									
0	6	21.0	-42.7	96.4	6	14.3	-43.4	96.5	6	07.5	-44.2	96.6	6	00.5	-44.9	96.7	5	53.4	-45.5	96.8	5	46.3	-46.3	96.9	5	39.0	-46.9	97.0	5	31.6	-47.5	97.1	0
1	5	38.3	-42.7	97.1	5	30.9	-43.5	97.2	5	23.3	-44.2	97.3	5	15.6	-44.9	97.4	5	07.9	-45.6	97.5	5	00.0	-46.2	97.6	4	52.1	-46.9	97.6	4	44.1	-47.6	97.7	1
2	4	55.6	-42.8	97.8	4	47.4	-43.6	97.9	4	39.1	-44.2	98.0	4	30.7	-44.9	98.0	4	22.3	-45.6	98.1	4	13.8	-46.3	98.2	4	05.2	-46.9	98.3	3	56.5	-47.5	98.3	3
3	4	12.8	-42.9	98.5	4	03.8	-43.5	98.6	3	54.9	-44.3	98.6	3	45.8	-45.0	98.7	3	36.7	-45.7	98.8	3	27.5	-46.3	98.8	3	18.3	-47.0	98.9	3				
4	3	29.9	-42.9	99.2	3	20.3	-43.6	99.3	3	10.6	-44.3	99.3	3	00.8	-44.9	99.4	2	51.0	-45.6	99.4	2	41.2	-46.3	99.5	2	31.3	-47.0	99.5	2				
5	2	47.0	-42.9	99.9	2	36.7	-43.6	100.0	2	26.3	-44.3	100.0	2	15.9	-45.1	100.0	2	05.4	-45.7	100.1	1	54.9	-46.4	100.1	1	44.3	-47.0	100.1	5				
6	2	04.1	-42.9	100.6	1	53.1	-43.7	100.6	1	42.0	-44.4	100.7	1	30.8	-45.0	100.7	1	19.7	-45.7	100.7	1	08.5	-46.3	100.7	0	57.3	-47.0	100.8	6				
7	1	21.2	-42.9	101.3	1	09.4	-43.6	101.3	0	57.6	-44.3	101.3	0	45.8	-45.0	101.4	0	34.0	-45.7	101.4	0	22.2	-46.4	101.4	0	10.3	-47.0	101.4	7				
8	0	38.3	-43.0	102.0	0	25.8	-43.7	102.0	0	13.3	-44.4	102.0	0	00.8	-45.0	102.0	0	11.7	+45.7	78.0	0	24.2	+46.3	78.0	0	36.7	+47.0	78.0	0	49.1	+47.7	78.0	8
9	0	04.7	+42.9	77.3	0	17.9	+43.6	77.3	0	31.1	+44.3	77.3	0	44.2	+45.1	77.3	0	57.4	+45.7	77.3	1	10.5	+46.4	77.4	1	23.7	+47.0	77.4	1	36.8	+47.6	77.4	9
10	0	47.6	+43.0	76.6	1	01.5	+43.7	76.6	1	15.4	+44.3	76.6	1	29.3	+45.0	76.7	1	43.1	+45.7	76.7	1	56.9	+46.3	76.7	2	10.7	+46.9	76.8	2	24.4	+47.6	76.8	10
11	1	30.6	+42.9	75.9	1	45.2	+43.6	75.9	1	59.7	+44.3	76.0	2	14.3	+45.0	76.0	2	28.8	+45.6	76.0	2	43.2	+46.3	76.1	2	57.6	+47.0	76.2	11				
12	2	13.5	+42.9	75.2	2	28.8	+43.6	75.2	2	44.0	+44.3	75.3	2	59.3	+44.9	75.3	3	14.4	+45.7	75.4	3	29.5	+46.3	75.4	3	44.6	+46.9	75.5	12				
13	2	56.4	+42.9	74.5	3	12.4	+43.6	74.6	3	28.3	+44.3	74.6	3	44.2	+45.0	74.7	4	00.1	+45.6	74.7	4	15.8	+46.3	74.8	4	31.5	+46.9	74.9	13				
14	3	39.3	+42.8	73.8	3	56.0	+43.5	73.9	4	12.6	+44.2	73.9	4	29.2	+44.9	74.0	4	45.7	+45.5	74.1	5	02.1	+46.2	74.2	5	18.4	+46.9	74.3	14				
15	4	22.1	+42.8	73.1	4	39.5	+43.5	73.2	4	56.8	+44.2	73.3	5	14.1	+44.8	73.3	5	31.2	+45.5	73.4	5	48.3	+46.2	73.5	6	05.3	+46.8	73.6	15				
16	5	04.9	+42.8	72.4	5	23.0	+43.5	72.5	5	41.0	+44.1	72.6	5	58.9	+44.8	72.7	6	16.7	+45.5	72.8	6	34.5	+46.1	72.9	6	52.1	+46.7	73.0	16				
17	6	54.7	+42.7	71.7	6	06.5	+43.4	71.8	6	25.1	+44.1	71.9	6	43.7	+44.8	72.0	7	02.2	+44.5	72.1	7	20.6	+46.0	72.2	7	38.8	+46.7	72.4	17				
18	6	30.4	+42.6	71.0	6	49.9	+43.3	71.1	7	09.2	+44.1	71.2	7	28.5	+44.7	71.3	7	47.6	+45.4	71.5	8	06.6	+46.1	71.6	8	25.5	+46.7	71.7	18				
19	7	13.0	+42.6	70.3	7	33.2	+43.3	70.4	7	53.3	+43.9	70.5	8	13.2	+44.6	70.7	8	33.0	+45.3	70.8	8	52.7	+45.9	70.9	9	12.2	+46.5	71.1	9	31.5	+47.2	71.3	19
20	7	55.6	+42.5	69.6	8	16.5	+43.2	69.7	8	37.2	+43.9	69.8	8	57.8	+44.6	70.0	9	18.3	+45.2	70.1	9	38.6	+45.9	70.3	9	58.7	+46.6	70.5	10	18.7	+47.2	70.6	20
21	8	38.1	+42.4	68.9	8	59.3	+43.1	69.0	9	21.1	+43.8	69.1	9	42.4	+44.4	69.3	10	03.5	+45.1	69.5	10	24.5	+45.7	69.6	10	45.3	+46.4	69.8	11	05.9	+47.0	70.0	21
22	9	20.5	+42.4	68.1	9	42.8	+43.0	68.3	10	04.9	+43.7	68.5	10	26.8	+44.4	68.6	10	48.6	+45.1	68.8	11	10.2	+45.7	69.0	11	31.7	+46.3	69.2	11	52.9	+47.0	69.4	22
23	10	02.9	+42.2	67.4	10	25.8	+43.0	67.6	10	48.6	+43.6	67.8	11	11.2	+44.3	67.9	11	33.7	+44.9	68.1	12	18.0	+46.3	68.3	12	38.9	+46.9	68.7	13	20.4	+47.2	69.8	23
24	10	45.1	+42.2	66.7	11	08.8	+42.8	66.9	11	32.2	+43.6	67.1	11	55.5	+44.2	67.3	12	18.6	+45.4	67.4	12	41.5	+45.6	67.7	13	04.3	+46.1	67.9	13	26.8	+46.7	68.1	24
25	11	27.3	+42.0	66.0	11	51.6	+42.7	66.2	12	15.8	+43.4	66.4	12	39.7	+44.1	66.6	13	03.5	+44.7	66.8	13	27.1	+45.4	67.0	13	50.4	+46.0	67.2	14	13.5	+46.7	67.4	25
26	12	09.3	+41.9	65.2	12	34.3	+42.6	65.4	12	59.2	+43.3	65.6	13	23.8	+44.0	65.8	13	48.2	+44.7	66.1	14	12.5	+45.2	66.3	14	36.4	+46.0	66.5	15	00.2	+46.6	66.8	26
27	12	51.2	+41.8	64.5	13	16.9	+42.5	64.7	13	42.5	+43.1	64.9	14	07.8	+43.8	65.2	14	32.9	+44.5	65.4	14	57.7	+45.2	65.6	15	22.4	+45.8	65.9	15	46.8	+46.4	66.1	27
28	13	33.0	+41.7	63.8	13	59.4	+42.4	64.0	14	25.6	+43.1	64.2	14	51.6	+43.7	64.5	15	17.4	+44.4	64.7	15	42.9	+45.0	65.0	16	08.2	+45.7	65.2	16	33.2	+46.3	65.5	28
29	14	14.7	+41.5	63.0	14	41.8	+42.2	63.3	15	08.7	+42.9	63.5	15	35.3	+43.6	63.7	16	01.8	+44.2	64.0	16	27.9	+44.9	64.3	17	51.9	+45.5	64.5	18				
30	14	56.2	+41.4	62.3	15	24.0	+42.1	62.5	15	51.6	+42.7	62.8	16	18.9	+43.4	63.0	16	46.0	+44.1	63.3	17	12.8	+44.8	63.6	17	39.4	+45.4	63.9	18	05.7	+46.1	64.1	30
31	15	37.6	+41.3	61.5	16	06.1	+41.9	61.8	16	34.3	+42.6	62.0	17	02.3	+43.3	62.3	17	30.1	+43.9	62.6	17	57.6	+44.6	62.9	18	24.8	+45.3	63.2	19	51.8	+45.9	63.5	31
32	16	18.8	+41.0	61.0	16	48.0	+41.8	61.0	17	16.9	+42.5	61.3	17	45.6	+43.1	61.6	18	14.0	+43.8	61.9	19	10.1	+45.1	62.5	19	37.7	+45.7	62.8	20				
33	16	59.9	+40.9	60.0	17	29.8	+41.6	60.3	17	59.4	+42.3	60.6	18	28.7	+43.0	60.9	18	57.8	+43.6	61.1	19	26.6	+44.3	61.5	20	19.5	+44.9	61.8	21	23.4	+45.6	62.1	33
34	17	40.8	+40.7	59.3	18	34.8	+41.5	59.5	19	23.8	+41.9	59.9	19	54.5	+42.5	60.1	20	24.9	+43.2	60.5	20	55.0	+43.9	60.0	21	24.9	+44.5	60.3	21	54.4	+45.2	60.7	35
35	18	21.5	+40.6	58.5	18	52.8	+41.2	58.8	19	23.8	+41.9	59.1	19	54.5	+42.5	59.4	20	24.9	+43.2	59.7	20	55.0	+43.9	60.0	21	24.9	+44.5	60.3	21	54.4			

82°, 278° L.H.A.

LATITUDE SAME NAME AS DECLINATION

{ L.H.A. greater than 180°Zn=Z
N. Lat. { L.H.A. less than 180°Zn=360°-Z }

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			Dec.								
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z									
0	5 38.9 +42.6	95.7	5 32.9 +43.3	95.8	5 26.8 +44.0	95.9	5 20.6 +44.8	96.0	5 14.3 +45.5	96.1	5 07.9 +46.2	96.1	5 01.5 +46.8	96.2	4 54.9 +47.5	96.3	0	5 38.9 +42.6	95.7	5 32.9 +43.3	95.8	5 26.8 +44.0	95.9	5 20.6 +44.8	96.0	5 14.3 +45.5	96.1	5 07.9 +46.2	96.1	5 01.5 +46.8	96.2	4 54.9 +47.5	96.3
1	6 21.5 +42.5	95.0	6 16.2 +43.3	95.1	6 10.8 +44.0	95.2	6 05.4 +44.7	95.3	5 59.8 +45.4	95.4	5 54.1 +46.1	95.5	5 48.3 +46.7	95.6	5 42.4 +47.4	95.7	1	6 21.5 +42.5	95.0	6 16.2 +43.3	95.1	6 10.8 +44.0	95.2	6 05.4 +44.7	95.3	5 59.8 +45.4	95.4	5 54.1 +46.1	95.5	5 48.3 +46.7	95.6	5 42.4 +47.4	95.7
2	7 04.0 +42.5	94.3	6 59.5 +43.2	94.4	6 54.8 +44.0	94.5	6 50.1 +44.6	94.6	6 45.2 +45.3	94.7	6 40.2 +46.0	94.9	6 35.0 +46.7	95.0	6 29.8 +47.3	95.1	2	7 04.0 +42.5	94.3	6 59.5 +43.2	94.4	6 54.8 +44.0	94.5	6 50.1 +44.6	94.6	6 45.2 +45.3	94.7	6 40.2 +46.0	94.9	6 35.0 +46.7	95.0	6 29.8 +47.3	95.1
3	7 46.5 +42.4	93.5	7 42.7 +43.2	93.7	7 38.8 +43.9	93.8	7 34.7 +44.6	93.9	7 30.5 +45.3	94.1	7 26.2 +46.0	94.2	7 21.7 +46.7	94.3	7 17.1 +47.3	94.5	3	7 46.5 +42.4	93.5	7 42.7 +43.2	93.7	7 38.8 +43.9	93.8	7 34.7 +44.6	93.9	7 30.5 +45.3	94.1	7 26.2 +46.0	94.2	7 21.7 +46.7	94.3	7 17.1 +47.3	94.5
4	8 28.9 +42.3	92.8	8 25.9 +43.0	93.0	8 22.7 +43.3	93.1	8 19.3 +44.5	93.3	8 15.8 +45.2	93.4	8 12.2 +45.9	93.6	8 08.4 +46.6	93.7	8 04.4 +47.3	93.8	4	8 28.9 +42.3	92.8	8 25.9 +43.0	93.0	8 22.7 +43.3	93.1	8 19.3 +44.5	93.3	8 15.8 +45.2	93.4	8 12.2 +45.9	93.6	8 08.4 +46.6	93.7	8 04.4 +47.3	93.8
5	9 11.2 +42.3	92.1	9 08.9 +43.0	92.3	9 06.5 +43.7	92.4	9 03.8 +44.5	92.6	9 01.0 +45.2	92.8	8 58.1 +45.8	92.9	8 55.0 +46.5	93.1	8 51.7 +47.1	93.2	5	9 11.2 +42.3	92.1	9 08.9 +43.0	92.3	9 06.5 +43.7	92.4	9 03.8 +44.5	92.6	9 01.0 +45.2	92.8	8 58.1 +45.8	92.9	8 55.0 +46.5	93.1	8 51.7 +47.1	93.2
6	9 53.5 +42.2	91.4	9 51.9 +43.0	91.6	9 50.2 +43.7	91.7	9 48.3 +44.4	91.9	9 46.2 +45.1	92.1	9 43.9 +45.8	92.3	9 41.5 +46.4	92.4	9 38.8 +47.2	92.6	6	9 53.5 +42.2	91.4	9 51.9 +43.0	91.6	9 50.2 +43.7	91.7	9 48.3 +44.4	91.9	9 46.2 +45.1	92.1	9 43.9 +45.8	92.3	9 41.5 +46.4	92.4	9 38.8 +47.2	92.6
7	10 35.7 +42.0	90.7	10 34.9 +42.8	90.9	10 33.9 +43.5	91.0	10 32.7 +44.2	91.2	10 31.3 +45.0	91.4	10 29.7 +45.7	91.6	10 27.9 +46.4	91.8	10 26.0 +47.0	92.0	7	10 35.7 +42.0	90.7	10 34.9 +42.8	90.9	10 33.9 +43.5	91.0	10 32.7 +44.2	91.2	10 31.3 +45.0	91.4	10 29.7 +45.7	91.6	10 27.9 +46.4	91.8	10 26.0 +47.0	92.0
8	11 17.7 +42.0	89.9	11 17.7 +42.7	90.1	11 17.4 +43.5	90.3	11 16.9 +44.2	90.5	11 16.3 +44.9	90.7	11 15.4 +45.6	90.9	11 14.3 +46.3	91.1	11 13.0 +47.0	91.3	8	11 17.7 +42.0	89.9	11 17.7 +42.7	90.1	11 17.4 +43.5	90.3	11 16.9 +44.2	90.5	11 16.3 +44.9	90.7	11 15.4 +45.6	90.9	11 14.3 +46.3	91.1	11 13.0 +47.0	91.3
9	11 59.7 +41.8	89.2	12 00.4 +42.6	89.4	12 00.5 +43.3	89.6	12 01.1 +44.1	89.9	12 01.2 +44.8	90.1	12 01.0 +45.5	90.3	12 00.6 +46.2	90.5	12 00.0 +46.8	90.7	9	11 59.7 +41.8	89.2	12 00.4 +42.6	89.4	12 00.5 +43.3	89.6	12 01.1 +44.1	89.9	12 01.2 +44.8	90.1	12 01.0 +45.5	90.3	12 00.6 +46.2	90.5	12 00.0 +46.8	90.7
10	12 41.5 +41.7	88.5	12 43.0 +42.4	88.7	12 44.2 +43.2	88.9	12 45.2 +44.0	89.2	12 46.0 +44.7	89.4	12 46.5 +45.4	89.6	12 46.8 +46.1	89.8	12 46.8 +46.8	89.8	10	12 41.5 +41.7	88.5	12 43.0 +42.4	88.7	12 44.2 +43.2	88.9	12 45.2 +44.0	89.2	12 46.0 +44.7	89.4	12 46.5 +45.4	89.6	12 46.8 +46.1	89.8	12 46.8 +46.8	89.8
11	13 23.2 +41.6	87.7	13 25.4 +42.4	88.0	13 27.4 +43.2	88.2	13 29.2 +43.8	88.5	13 30.7 +44.5	88.7	13 31.9 +45.3	88.9	13 32.9 +46.0	89.2	13 33.6 +46.7	89.4	11	13 23.2 +41.6	87.7	13 25.4 +42.4	88.0	13 27.4 +43.2	88.2	13 29.2 +43.8	88.5	13 30.7 +44.5	88.7	13 31.9 +45.3	88.9	13 32.9 +46.0	89.2	13 33.6 +46.7	89.4
12	14 04.8 +41.4	87.0	14 07.8 +42.2	87.3	14 10.6 +42.9	87.8	14 13.0 +43.6	88.4	14 15.2 +44.3	88.8	14 17.2 +44.6	89.2	14 19.8 +45.9	89.5	14 20.3 +46.4	89.8	14	14 04.8 +41.4	87.0	14 07.8 +42.2	87.3	14 10.6 +42.9	87.8	14 13.0 +43.6	88.4	14 15.2 +44.3	88.8	14 17.2 +44.6	89.2	14 19.8 +45.9	89.5	14 20.3 +46.4	89.8
13	14 46.2 +41.4	86.3	14 50.0 +42.1	86.5	14 53.5 +42.9	86.8	14 56.8 +43.6	87.0	14 59.7 +44.3	87.3	15 02.4 +45.0	87.6	15 04.8 +45.7	87.9	15 06.9 +46.4	88.1	15	14 46.2 +41.4	86.3	14 50.0 +42.1	86.5	14 53.5 +42.9	86.8	14 56.8 +43.6	87.0	14 59.7 +44.3	87.3	15 02.4 +45.0	87.6	15 04.8 +45.7	87.9	15 06.9 +46.4	88.1
14	15 27.6 +41.1	85.5	15 32.1 +41.9	85.8	15 36.4 +42.7	86.1	15 40.4 +43.4	86.3	15 44.0 +44.3	86.6	15 47.4 +45.0	86.9	15 50.5 +45.7	87.2	15 53.3 +46.4	87.5	15	15 27.6 +41.1	85.5	15 32.1 +41.9	85.8	15 36.4 +42.7	86.1	15 40.4 +43.4	86.3	15 44.0 +44.3	86.6	15 47.4 +45.0	86.9	15 50.5 +45.7	87.2	15 53.3 +46.4	87.5
15	16 08.7 +41.0	84.7	16 14.0 +41.8	85.0	16 19.1 +42.5	85.3	16 23.8 +43.3	85.6	16 28.3 +44.0	85.9	16 32.4 +44.8	86.2	16 36.2 +45.5	86.5	16 39.7 +46.2	86.8	16	16 08.7 +41.0	84.7	16 14.0 +41.8	85.0	16 19.1 +42.5	85.3	16 23.8 +43.3	85.6	16 28.3 +44.0	85.9	16 32.4 +44.8	86.2	16 36.2 +45.5	86.5	16 39.7 +46.2	86.8
16	16 49.7 +40.8	84.0	16 55.8 +41.6	84.3	17 01.6 +42.4	84.6	17 07.1 +43.2	84.9	17 13.2 +43.9	85.2	17 21.7 +44.6	85.5	17 29.1 +45.4	85.8	17 35.9 +46.1	86.1	17	16 49.7 +40.8	84.0	16 55.8 +41.6	84.3	17 01.6 +42.4	84.6	17 07.1 +43.2	84.9	17 13.2 +43.9	85.2	17 21.7 +44.6	85.5	17 29.1 +45.4	85.8	17 35.9 +46.1	86.1
17	17 30.5 +40.7	83.2	17 37.4 +41.5	83.5	17 44.0 +42.3	83.8	17 50.3 +43.0	84.2	17 56.2 +43.8	84.5	18 01.8 +44.9	84.8	18 07.1 +45.2	85.1	18 12.0 +45.9	85.5	18	17 30.5 +40.7	83.2	17 37.4 +41.5	83.5	17 44.0 +42.3	83.8	17 50.3 +43.0	84.2	17 56.2 +43.8	84.5	18 01.8 +44.9	84.8	18 07.1 +45.2	85.1	18 12.0 +45.9	85.5
18	18 11.2 +40.4	82.4	18 18.9 +41.2	82.8	18 26.3 +42.0	83.1	18 33.3 +42.8	83.4	18 40.0 +43.6	83.8	18 46.3 +44.3	84.1	18 52.3 +45.0	84.4	18 58.3 +45.8	84.7	18	18 11.2 +40.4	82.4	18 18.9 +41.2	82.8	18 26.3 +42.0	83.1	18 33.3 +42.8	83.4	18 40.0 +43.6	83.8	18 46.3 +44.3	84.1	18 52.3 +45.0	84.4	18 58.3 +45.8	84.7
19	18 51.6 +40.3	81.7	19 00.1 +41.1	82.0	19 08.3 +41.9	82.3	19 16.1 +42.7	82.7	19 23.6 +43.4	83.0	19 30.6 +44.2	83.4	19 37.4 +45.0	83.7	19 43.7 +45.7	84.0	19	18 51.6 +40.3	81.7	19 00.1 +41.1	82.0	19 08.3 +41.9	82.3	19 16.1 +42.7	82.7	19 23.6 +43.4	83.0	19 30.6 +44.2	83.4	19 37.4 +45.0	83.7	19 43.7 +45.7	84.0
20	19 31.9 +40.0	80.9	19 41.2 +40.9	81.2	19 50.2 +41.6	81.5	20 31.8 +41.5	80.8	20 41.2 +42.3	81.2	20 50.2 +43.0	81.6	20 58.8 +43.8	81.9	21 07.0 +44.6	82.3	21	19 31.9 +40.0	80.9	19 41.2 +40.9	81.2	19 50.2 +41.6	81.5	20 31.8 +41.5	80.8	20 41.2 +42.3	81.2	20 50.2 +43.0	81.6	20 58.8 +43.8	81.9	21 07.0 +44.6	82.3
21	20 11.9 +39.9	80.1	20 22.1 +40.6	80.5	20 31.5 +41.4	80.8	20 41.2 +42.3	81.2	20 50.2 +43.0	81.6	20 58.8 +43.8	81.9	21 07.0 +44.6	82.3	21 14.8 +45.3	82.7	21	20 11.9 +39.9	80.1	20 22.1 +40.6	80.5	20 31.5 +41.4	80.8	20 41.2 +42.3	81.2	20 50.2 +43.0	81.6	20 58.8 +43.8	81.9	21 07.0 +44.6	82.3		
22	20 51.8 +39.6	79.3	21 02.7 +40.5	79.7	21 13.3 +41.2	80.0	21 23.5 +42.0	80.4	21 33.2 +42.9	80.8	21 42.6 +43.6	81.2	21 51.6 +44.3	81.6	22 00.1 +45.1	82.0	22	20 51.8 +39.6	79.3	21 02.7 +40.5	79.7	21 13.3 +41.2	80.0										

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 82°, 278°

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			Dec.
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	
0	5 38.9 -42.7	95.7	5 32.9 -43.4	95.8	5 26.8 -44.1	95.9	5 20.6 -44.8	96.0	5 14.3 -45.5	96.1	5 07.9 -46.1	96.1	5 01.5 -46.8	96.2	4 54.9 -47.5	96.3	0	0	,	,	,	,	,	,	
1	4 56.2 -42.7	96.4	4 49.5 -43.4	96.5	4 42.7 -44.2	96.5	4 35.8 -44.8	96.6	4 28.8 -45.5	96.7	4 21.8 -46.2	96.8	4 14.7 -46.9	96.9	4 07.4 -47.5	96.9	1	0	,	,	,	,	,	,	
2	4 13.5 -42.7	97.1	4 06.1 -43.5	97.2	3 58.5 -44.1	97.2	3 51.0 -44.9	97.3	3 43.3 -45.6	97.4	3 35.6 -46.2	97.4	3 27.8 -46.9	97.5	3 19.9 -47.5	97.5	2	0	,	,	,	,	,	,	
3	3 30.8 -42.8	97.8	3 22.6 -43.5	97.8	3 14.4 -44.2	97.9	3 06.1 -44.9	98.0	2 57.7 -45.5	98.0	2 49.4 -46.3	98.1	2 40.9 -46.9	98.1	2 32.4 -47.5	98.2	3	0	,	,	,	,	,	,	
4	2 48.0 -42.8	98.5	2 39.1 -43.5	98.5	2 30.2 -44.3	98.6	2 21.2 -44.9	98.7	2 03.1 -46.2	98.7	1 54.0 -46.9	98.7	1 44.9 -47.6	98.8	4	0	,	,	,	,	,	,			
5	2 05.2 -42.8	99.2	1 55.6 -43.6	99.2	1 45.9 -44.2	99.3	1 36.3 -45.0	99.3	1 26.6 -45.6	99.3	1 16.9 -46.3	99.3	1 07.1 -46.9	99.4	0 57.3 -47.5	99.4	5	0	,	,	,	,	,	,	
6	1 22.4 -42.9	99.9	1 12.0 -43.5	99.9	1 01.7 -44.2	99.9	0 51.3 -44.9	100.0	0 41.0 -45.6	100.0	0 30.6 -46.3	100.0	0 20.2 -46.9	100.0	0 09.8 -47.6	100.0	6	0	,	,	,	,	,	,	
7	0 39.5 -42.8	100.6	0 28.5 -43.5	100.6	0 17.5 -44.3	100.6	0 06.4 -44.9	100.6	0 04.6 +45.7	79.4	0 15.7 +46.3	79.4	0 26.7 +47.0	79.4	0 37.8 +47.5	79.4	7	0	,	,	,	,	,	,	
8	0 03.3 +42.8	78.7	0 15.0 +43.6	78.7	0 26.8 +44.2	78.7	0 38.5 +45.0	78.7	0 50.3 +45.6	78.7	1 02.0 +46.2	78.8	1 13.7 +46.9	78.8	1 25.3 +47.6	78.8	8	0	,	,	,	,	,	,	
9	0 46.1 +42.9	78.0	0 58.6 +43.5	78.0	1 11.0 +44.3	78.0	1 23.5 +44.9	78.1	1 35.9 +45.6	78.1	1 48.2 +46.3	78.1	2 00.6 +46.9	78.1	2 12.9 +47.5	78.2	9	0	,	,	,	,	,	,	
10	1 29.0 +42.8	77.3	1 42.1 +43.5	77.3	1 55.3 +44.2	77.4	2 08.4 +44.9	77.4	2 21.5 +45.5	77.4	2 34.5 +46.2	77.5	2 47.5 +46.8	77.5	3 00.4 +47.5	77.6	10	0	,	,	,	,	,	,	
11	2 11.8 +42.8	76.6	2 25.6 +43.6	76.6	2 39.5 +44.2	76.7	2 53.3 +44.9	76.7	3 07.0 +45.6	76.8	3 20.7 +46.2	76.8	3 34.3 +46.9	76.9	3 47.9 +47.5	77.0	11	0	,	,	,	,	,	,	
12	2 54.6 +42.7	75.9	3 09.2 +43.4	76.0	3 23.7 +44.2	76.0	3 38.2 +44.8	76.1	3 52.6 +45.5	76.1	4 06.9 +46.2	76.2	4 21.2 +46.8	76.3	4 35.4 +47.5	76.3	12	0	,	,	,	,	,	,	
13	3 37.3 +42.8	75.2	3 52.6 +43.5	75.3	4 07.9 +44.1	75.3	4 23.0 +44.8	75.4	4 38.1 +45.5	75.5	4 53.1 +46.1	75.6	5 08.0 +46.8	75.6	5 22.9 +47.4	75.7	13	0	,	,	,	,	,	,	
14	4 20.1 +42.7	74.5	4 36.1 +43.4	74.6	4 52.0 +44.1	74.7	5 07.8 +44.8	74.7	5 23.6 +45.4	74.8	5 39.2 +46.1	74.9	5 54.8 +46.7	75.0	6 10.3 +47.3	75.1	14	0	,	,	,	,	,	,	
15	5 02.8 +42.6	73.8	5 19.5 +43.3	73.9	5 36.1 +44.0	74.0	5 52.6 +44.7	74.1	6 09.0 +45.4	74.2	6 25.3 +46.1	74.3	6 41.5 +46.7	74.4	6 57.6 +47.4	74.5	15	0	,	,	,	,	,	,	
16	5 45.4 +42.6	73.1	6 02.8 +43.3	73.2	6 20.1 +44.0	73.3	6 37.3 +44.7	73.4	6 54.4 +45.4	73.5	7 11.4 +46.0	73.6	7 28.2 +46.7	73.8	7 45.0 +47.2	73.9	16	0	,	,	,	,	,	,	
17	6 28.0 +42.5	72.4	6 46.1 +43.3	72.5	7 04.1 +44.0	72.6	7 22.0 +44.6	72.7	7 39.8 +45.2	72.8	7 57.4 +45.9	73.0	8 14.9 +46.6	73.1	8 32.2 +47.2	73.3	17	0	,	,	,	,	,	,	
18	7 10.5 +42.5	71.7	7 29.4 +43.1	71.8	7 48.1 +43.8	71.9	8 06.6 +44.6	72.0	8 25.0 +45.2	72.2	8 43.3 +45.9	72.3	9 01.5 +46.5	72.5	9 19.4 +47.2	72.6	18	0	,	,	,	,	,	,	
19	7 53.0 +42.4	71.0	8 12.5 +43.1	71.1	8 31.9 +43.8	71.2	8 51.2 +44.4	71.4	9 10.2 +45.2	71.5	9 29.2 +45.8	71.7	9 48.0 +46.4	71.8	10 06.6 +47.1	72.0	19	0	,	,	,	,	,	,	
20	8 35.4 +42.3	70.2	8 55.6 +43.1	70.4	9 15.7 +43.7	70.5	9 35.6 +44.4	70.7	9 55.4 +45.0	70.9	10 15.0 +45.7	71.0	10 34.4 +46.4	71.2	10 53.7 +47.0	71.4	20	0	,	,	,	,	,	,	
21	9 17.7 +42.3	69.5	9 38.7 +42.9	69.7	9 54.9 +43.6	69.8	10 20.0 +44.3	70.0	10 40.4 +45.0	70.2	11 00.7 +45.6	70.4	11 20.8 +46.2	70.5	11 40.7 +46.9	70.7	21	0	,	,	,	,	,	,	
22	10 00.0 +42.1	68.8	10 21.6 +42.8	69.0	10 43.0 +43.6	69.1	11 04.3 +44.2	69.3	11 25.4 +44.9	69.5	11 46.3 +45.6	69.7	12 07.0 +46.2	69.9	12 27.6 +46.8	70.1	22	0	,	,	,	,	,	,	
23	10 42.1 +42.1	68.1	11 04.4 +42.8	68.3	11 26.6 +43.4	68.4	11 48.5 +44.1	68.6	12 10.3 +44.8	68.8	12 31.9 +45.4	68.9	12 53.2 +46.1	69.2	13 14.4 +46.7	69.5	23	0	,	,	,	,	,	,	
24	11 24.2 +41.9	67.3	11 47.2 +42.6	67.5	12 10.0 +43.3	67.7	12 32.6 +44.0	67.9	12 55.1 +44.7	68.1	13 17.3 +45.3	68.4	13 39.3 +46.0	68.6	14 01.1 +46.6	68.8	24	0	,	,	,	,	,	,	
25	12 06.1 +41.8	66.6	12 29.8 +42.5	66.8	12 53.3 +43.2	67.0	13 16.6 +43.9	67.2	13 39.8 +44.5	67.5	14 02.6 +45.3	67.7	14 25.3 +45.9	67.9	14 47.7 +46.5	68.2	25	0	,	,	,	,	,	,	
26	12 47.9 +41.7	65.9	13 12.3 +42.4	66.1	13 36.5 +43.1	66.3	14 00.5 +43.8	66.5	14 24.3 +44.5	66.8	14 47.9 +45.1	67.0	15 11.2 +45.7	67.3	15 34.2 +46.4	67.5	26	0	,	,	,	,	,	,	
27	13 29.6 +41.6	65.1	13 54.7 +42.3	65.4	14 19.6 +43.0	65.6	14 44.3 +43.6	65.8	15 08.8 +44.3	66.1	15 33.0 +44.9	66.3	15 56.9 +45.7	66.6	16 20.6 +46.3	66.9	27	0	,	,	,	,	,	,	
28	14 11.2 +41.4	64.4	14 37.0 +42.1	64.6	15 02.6 +42.8	64.9	15 27.9 +43.5	65.1	15 53.1 +44.1	65.4	16 17.9 +44.9	65.6	16 42.6 +45.4	65.9	17 06.9 +46.2	66.2	28	0	,	,	,	,	,	,	
29	14 52.6 +41.3	63.7	15 19.1 +42.0	63.9	15 45.4 +42.7	64.1	16 11.4 +43.4	64.4	16 37.2 +44.1	64.7	17 02.8 +44.7	64.9	17 28.0 +45.4	65.2	17 53.1 +46.0	65.5	29	0	,	,	,	,	,	,	
30	15 33.9 +41.1	62.9	16 01.1 +41.8	63.2	16 28.1 +42.5	63.4	16 54.8 +43.2	63.7	17 21.3 +43.8	64.0	17 47.5 +44.5	64.2	18 13.4 +45.2	64.5	18 39.1 +45.8	64.8	30	0	,	,	,	,	,	,	
31	16 15.0 +41.0	62.1	16 42.9 +41.7	62.4	17 10.6 +42.3	62.7	17 38.0 +43.0	63.0	18 05.1 +43.8	63.2	18 32.0 +44.4	63.5	18 58.6 +45.1	63.8	19 24.9 +45.7	64.2	31	0	,	,	,	,	,	,	
32	16 56.0 +40.8	61.4	17 24.6 +41.5	61.7	17 52.9 +42.2	61.9	18 21.0 +42.9	62.2	18 48.9 +43.5	62.5	19 16.4 +44.2	62.8	19 43.7 +44.8	63.1	20 10.6 +45.5	63.5	32	0	,	,	,	,	,	,	
33	17 36.8 +40.6	60.6	18 06.1 +41.3	60.9	18 35.1 +42.0	61.2	19 03.9 +42.7	61.5	19 39.4 +42.7	61.7	20 06.6 +44.1	62.1	20 28.5 +44.8	62.4	21 56.1 +45.4	62.8	33	0	,	,	,	,	,	,	
34	18 17.4 +40.2	59.1	19 28.5 +41.0	59.4	19 59.0 +41.6	59.7	20 29.1 +42.3	60.0	20 59.0 +43.0	60.3	21 28.5 +43.7	60.7	21 57.8 +44.3	61.0	22 26.7 +45.0	61.4	35	0	,	,	,	,	,	,	
35	18 57.8 +40.2	58.1	19 28.5 +41.0	58.4	19 59.0 +41.6	59.7	20 29.1 +42.3	60.0	20 59.0 +43.0	60.3	21 28.5 +43.7	60.7	21 57.8 +44.3	61.0	22 26.7 +45.0	61.4	35	0	,	,	,	,	,	,	
36	19 38.0 +40.1	58.3	20 09.5 +40.7	58.6	20 40.6 +41.4	58.9	21 11.4 +42.1	59.2	21 42.0 +42.8	59.6	22 12.2 +43.5	59.9	22 42.1 +44.2	60.3	23 11.7 +44.8	60.6	36	0	,	,	,	,	,	,	
37	20 18.1 +39.8	57.5	20 50.2 +40.5	57.8	21 22.0 +41.2	58.1	21 53.5 +41.9	58.5	22 24.8 +42.5	58.8	22 55.7 +43.2	59.2	23 26.3 +43.9	59.5	23 56.5 +44.6	59.9	37	0	,	,	,	,	,	,	
38	20 57.9 +39.6	56.7	21 30.7 +40.3	57.0	22 03.2 +41.0	57.3	22 35.4 +41.7	57.7	23 07.3 +42.4	58.0	23 38.9 +43.1	58.4	24 10.2 +43.7	58.8	24 41.0 +44.4	59.2	38</								

83°, 277° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180°Zn=Z
L.H.A. less than 180°Zn=360°-Z

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			Dec.
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	
0	4 56.6 +42.6	95.0	4 51.4 +43.3	95.0	4 46.1 +44.0	95.1	4 40.6 +44.8	95.2	4 35.2 +45.4	95.3	4 29.6 +46.1	95.4	4 23.9 +46.8	95.5	4 18.2 +47.4	95.5	4 12.0 +48.1	95.5	4 5.6 +47.3	94.9	5 05.6 +47.3	94.9	0		
1	5 39.2 +42.5	94.3	5 34.7 +43.2	94.4	5 30.1 +43.9	94.4	5 25.4 +44.6	94.5	5 20.6 +45.3	94.6	5 15.7 +46.0	94.7	5 10.7 +46.7	94.8	5 05.6 +47.3	94.9	5 0.6 +47.3	94.9	5 52.9 +47.4	94.3	5 52.9 +47.4	94.3	1		
2	6 21.7 +42.4	93.5	6 17.9 +43.2	93.7	6 14.0 +43.9	93.8	6 10.0 +44.7	93.9	6 05.9 +45.3	94.0	6 01.7 +46.0	94.1	5 57.4 +46.6	94.2	5 52.9 +47.4	94.3	5 52.9 +47.4	94.3	5 52.9 +47.4	94.3	2				
3	7 04.1 +42.4	92.8	7 01.1 +43.1	93.0	6 57.9 +43.9	93.1	6 54.7 +44.5	93.2	6 51.2 +45.3	93.3	6 47.7 +46.0	93.4	6 44.0 +46.7	93.6	6 40.3 +47.2	93.7	6 36.1 +47.2	93.7	6 36.1 +47.2	93.7	3				
4	7 46.5 +42.3	92.1	7 44.2 +43.1	92.3	7 41.8 +43.8	92.4	7 39.2 +44.5	92.5	7 36.5 +45.2	92.7	7 33.7 +45.9	92.8	7 30.7 +46.5	92.9	7 27.5 +47.3	93.1	7 27.5 +47.3	93.1	7 27.5 +47.3	93.1	4				
5	8 28.8 +42.3	91.4	8 27.3 +43.0	91.6	8 25.6 +43.7	91.7	8 23.7 +44.5	91.8	8 21.7 +45.2	92.0	8 19.6 +45.8	92.1	8 17.2 +46.5	92.3	8 14.8 +47.1	92.4	8 12.0 +47.1	92.4	8 12.0 +47.1	92.4	5				
6	9 11.1 +42.1	90.7	9 10.3 +42.9	90.8	9 09.3 +43.6	91.0	9 08.2 +44.3	91.2	9 06.9 +45.0	91.3	9 05.4 +45.7	91.5	9 03.7 +46.5	91.6	9 01.9 +47.1	91.8	9 00.0 +47.1	91.8	9 00.0 +47.1	91.8	6				
7	9 53.2 +42.1	90.0	9 53.2 +42.8	90.1	9 52.9 +43.0	90.3	9 52.5 +44.3	90.5	9 51.9 +45.0	90.7	9 51.1 +45.7	90.8	9 50.2 +46.3	91.0	9 49.0 +47.1	91.2	9 48.0 +47.1	91.2	9 48.0 +47.1	91.2	7				
8	10 35.3 +41.9	89.2	10 36.0 +42.7	89.4	10 36.5 +43.4	89.6	10 36.8 +44.2	89.8	10 36.9 +44.9	90.0	10 36.8 +45.6	90.2	10 36.5 +46.3	90.4	10 36.1 +46.9	90.5	10 35.6 +46.9	90.5	10 35.6 +46.9	90.5	8				
9	11 17.2 +41.9	88.5	11 18.7 +42.6	88.7	11 19.9 +43.4	88.9	11 21.0 +44.1	89.1	11 21.8 +44.8	89.3	11 22.4 +45.5	89.5	11 22.8 +46.2	89.7	11 23.0 +46.9	89.9	11 23.0 +46.9	89.9	11 23.0 +46.9	89.9	9				
10	11 59.1 +41.7	87.8	12 01.3 +42.5	88.0	12 03.3 +43.2	88.2	12 05.1 +44.0	88.4	12 06.6 +44.7	88.6	12 07.9 +45.4	88.8	12 09.0 +46.1	89.1	12 09.9 +46.8	89.3	12 09.9 +46.8	89.3	12 09.9 +46.8	89.3	10				
11	12 40.8 +41.6	87.0	12 43.8 +42.4	87.3	12 46.5 +43.2	87.5	12 49.1 +43.8	87.7	12 51.3 +44.6	87.9	12 53.3 +45.4	88.2	12 55.1 +46.0	88.4	12 56.7 +46.7	88.6	12 56.7 +46.7	88.6	12 56.7 +46.7	88.6	11				
12	13 22.4 +41.5	86.3	13 26.2 +42.2	86.5	13 29.7 +43.0	86.8	13 32.9 +43.8	87.0	13 35.9 +44.5	87.3	13 38.7 +45.2	87.5	13 41.1 +45.9	87.7	13 43.4 +46.6	88.0	13 43.4 +46.6	88.0	13 43.4 +46.6	88.0	12				
13	14 03.9 +41.4	85.6	14 08.4 +42.2	85.8	14 12.7 +42.9	86.1	14 16.7 +43.6	86.3	14 20.4 +44.4	86.6	14 23.9 +45.0	86.8	14 27.0 +45.8	87.1	14 30.0 +46.5	87.3	14 30.0 +46.5	87.3	14 30.0 +46.5	87.3	13				
14	14 45.3 +41.2	84.8	14 50.6 +41.9	85.1	14 55.6 +42.7	85.3	15 00.3 +43.5	85.6	15 04.8 +44.2	85.9	15 08.9 +45.0	86.1	15 12.8 +45.7	86.4	15 16.5 +46.3	86.7	15 16.5 +46.3	86.7	15 16.5 +46.3	86.7	14				
15	15 26.5 +41.0	84.1	15 32.5 +41.9	84.3	15 38.3 +42.6	84.6	15 43.8 +43.4	84.9	15 49.0 +44.1	85.2	15 53.9 +44.8	85.5	15 58.5 +45.6	85.7	16 02.8 +46.3	86.0	16 02.8 +46.3	86.0	16 02.8 +46.3	86.0	15				
16	16 07.5 +40.9	83.3	16 14.4 +41.7	83.6	16 20.9 +42.5	83.9	16 27.2 +43.2	84.2	16 33.1 +44.0	84.5	16 38.7 +44.7	84.8	16 44.1 +45.4	85.1	16 49.1 +46.1	85.4	16 49.1 +46.1	85.4	16 49.1 +46.1	85.4	16				
17	16 48.4 +40.7	82.5	16 56.1 +41.5	82.8	17 03.4 +42.3	83.1	17 10.4 +43.0	83.4	17 17.1 +43.8	83.8	17 23.4 +44.6	84.1	17 29.5 +45.2	84.4	17 35.2 +46.0	84.7	17 35.2 +46.0	84.7	17 35.2 +46.0	84.7	17				
18	17 29.1 +40.6	81.8	17 37.6 +41.3	82.1	17 45.7 +42.1	82.4	17 53.4 +42.9	82.7	18 00.9 +43.6	83.0	18 08.0 +44.4	83.4	18 14.7 +45.2	83.7	18 21.2 +45.8	84.0	18 21.2 +45.8	84.0	18 21.2 +45.8	84.0	18				
19	18 09.7 +40.3	81.0	18 18.9 +41.1	81.3	18 27.8 +41.9	81.6	18 36.3 +42.7	82.0	18 44.5 +43.5	82.3	18 52.4 +44.2	82.7	18 59.9 +44.9	83.0	19 07.0 +45.7	83.3	19 07.0 +45.7	83.3	19 07.0 +45.7	83.3	19				
20	18 50.0 +40.2	80.2	19 00.0 +41.0	80.6	19 09.7 +41.8	80.9	19 19.0 +42.6	81.2	19 28.0 +43.3	81.6	19 36.6 +44.0	81.9	19 44.8 +44.8	82.3	19 52.7 +45.5	82.6	19 52.7 +45.5	82.6	19 52.7 +45.5	82.6	20				
21	19 30.2 +39.9	79.4	19 41.0 +40.8	79.8	19 51.5 +41.5	80.1	20 01.6 +42.3	80.5	20 11.3 +43.1	80.9	20 20.7 +43.8	81.2	20 29.6 +44.6	81.6	20 38.2 +45.4	82.0	20 38.2 +45.4	82.0	20 38.2 +45.4	82.0	21				
22	20 10.1 +39.8	78.6	20 21.8 +40.5	79.0	20 33.0 +41.4	79.4	20 43.9 +42.2	79.7	20 54.4 +42.9	80.1	21 04.5 +43.7	80.5	21 14.2 +44.5	80.9	21 23.6 +45.2	81.3	21 23.6 +45.2	81.3	21 23.6 +45.2	81.3	22				
23	20 49.9 +39.5	77.8	21 02.3 +40.3	78.2	21 14.4 +41.1	78.6	21 26.1 +41.9	79.0	21 37.3 +42.8	79.4	21 48.2 +43.5	79.7	21 58.7 +44.2	80.1	22 08.8 +44.9	80.5	22 08.8 +44.9	80.5	22 08.8 +44.9	80.5	23				
24	21 29.4 +39.2	77.0	21 42.6 +40.1	77.4	21 55.5 +40.9	77.8	22 08.0 +41.7	78.2	22 20.1 +42.5	78.6	22 31.7 +43.3	79.0	22 42.9 +44.1	79.4	22 53.7 +44.8	79.8	22 53.7 +44.8	79.8	22 53.7 +44.8	79.8	24				
25	22 08.6 +39.1	76.2	22 22.7 +39.9	76.6	22 36.4 +40.7	77.0	22 49.7 +41.5	77.4	23 02.6 +42.2	77.8	23 15.0 +43.1	78.3	23 27.0 +43.8	78.7	23 38.5 +44.6	79.1	23 38.5 +44.6	79.1	23 38.5 +44.6	79.1	25				
26	22 47.7 +38.8	75.4	23 02.6 +39.6	75.8	23 17.1 +40.4	76.2	23 31.2 +41.2	76.6	23 44.8 +42.1	77.1	23 58.1 +42.8	77.5	24 10.8 +43.6	77.9	24 23.1 +44.4	78.4	24 23.1 +44.4	78.4	24 23.1 +44.4	78.4	26				
27	23 26.5 +38.5	74.6	23 42.2 +39.4	75.0	23 57.5 +40.2	75.4	24 12.4 +41.0	75.8	24 26.9 +41.8	76.3	24 40.9 +42.6	76.7	24 54.4 +43.4	77.2	25 07.5 +44.2	77.6	25 07.5 +44.2	77.6	25 07.5 +44.2	77.6	27				
28	24 05.0 +38.2	73.7	24 21.6 +39.0	74.2	24 37.7 +39.9	74.6	24 53.4 +40.8	75.0	25 08.7 +41.5	75.5	25 23.5 +42.4	75.9	25 37.8 +43.2	76.4	25 51.7 +43.9	76.9	25 51.7 +43.9	76.9	25 51.7 +43.9	76.9	28				
29	24 43.2 +37.9	72.9	25 00.6 +38.8	73.3	25 17.6 +39.7	73.8	25 34.2 +40.4	74.2	25 50.2 +41.3	74.7	26 05.9 +42.0	75.2	26 21.0 +42.9	75.6	26 35.6 +43.7	76.1	26 35.6 +43.7	76.1	26 35.6 +43.7	76.1	29				
30	25 21.1 +37.7	72.0	25 39.4 +38.5	72.5	25 57.3 +39.3	72.9	26 14.6 +40.2	73.4	26 31.5 +41.0	73.9	26 47.9 +41.9	74.4	27 03.9 +42.6	74.9	27 19.3 +43.4	75.4	27 19.3 +43.4	75.4	27 19.3 +43.4	75.4	30				
31	25 58.8 +37.3	71.2	26 17.9 +38.2	71.6	26 36.6 +39.1	72.1	26 54.8 +39.9	72.6	27 12.5 +40.8	73.1	27 29.8 +41.5	73.6	27 46.7 +42.4	74.1	28 02.7 +43.2	74.6	28 02.7 +43.2	74.6	28 02.7 +43.2	74.6	31				
32	26 36.1 +37.0	70.3	26 56.1 +37.9	70.8	27 15.7 +38.7	71.2	27 34.7 +39.6	71.7	27 53.3 +40.4	72.2	28 11.3 +41.3	72.7	28 28.9 +42.0	73.3	28 45.9 +42.9	73.8	28 45.9 +42.9	73.8	28 45.9 +42.9	73.8	32				
33	27 13.1 +36.7	69.4	27 34.0 +37.5	69.9	27 54.4 +38.4	70.4	28 14.3 +39.2	70.9	28 33.7 +40.1	71.4	28 52.6 +40.9	71.8	29 10.9 +41.8	72.4	29 28.8 +42.5	73.0	29 28.8 +42.5	73.0	29 28.8 +42.5	73.0	33				
34	28 26.1 +36.0	67.6	28 48.7 +36.9	68.1	29 10.9 +37.7	68.6	29 32.5 +38.6	69.2	29 53.6 +39.4	69.7	30 14.1 +40.3	70.2	30 34.1 +41.2	70.8	30 53.6 +42.0	71.3	30 53.6 +42.0	71.3	30 53.6 +42.0	71.3	35				
35																									

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 83°, 277°

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			Dec.			
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z				
0	4	56.6	-42.6	95.0	4	51.4	-43.4	95.0	4	46.1	-44.1	95.1	4	40.6	-44.7	95.2	4	35.2	-45.5	95.3	4	29.6	-46.1	95.4	4	18.2	-47.5	95.5
1	4	14.0	-42.6	95.7	4	08.0	-43.3	95.7	4	02.0	-44.1	95.8	3	55.9	-44.8	95.9	3	49.7	-45.5	95.9	3	43.5	-46.2	96.0	3	37.1	-46.8	96.1
2	3	31.4	-42.7	96.4	3	24.7	-43.4	96.4	3	17.9	-44.1	96.5	3	11.1	-44.8	96.5	3	04.2	-45.5	96.6	2	57.3	-46.2	96.7	2	50.3	-46.8	96.8
3	2	48.7	-42.7	97.1	2	41.3	-43.5	97.1	2	33.8	-44.1	97.2	2	26.3	-44.8	97.2	2	18.7	-45.5	97.3	2	11.1	-46.1	97.3	2	03.5	-46.8	97.4
4	2	66.0	-42.7	97.8	1	57.8	-43.4	97.8	1	49.7	-44.2	97.8	1	41.5	-44.9	97.9	1	33.2	-45.5	97.9	1	25.0	-46.2	97.9	1	16.7	-46.9	98.0
5	1	23.3	-42.8	98.5	1	14.4	-43.5	98.5	1	05.5	-44.1	98.5	0	56.6	-44.8	98.5	0	47.7	-45.5	98.6	0	38.8	-46.2	98.6	0	29.8	-46.8	98.6
6	0	40.5	-42.7	99.2	0	30.9	-43.4	99.2	0	21.4	-44.2	99.2	0	11.8	-44.9	99.2	0	02.2	-45.6	99.2	0	07.4	-46.2	99.2	0	20.9	-47.5	98.6
7	0	02.2	+42.7	80.1	0	12.5	+43.5	80.1	0	22.8	+44.2	80.1	0	33.1	+44.9	80.1	0	43.4	+45.5	80.1	0	53.6	+46.2	80.2	0	17.0	+46.9	80.8
8	0	44.9	+42.8	79.4	0	56.0	+43.4	79.4	1	07.0	+44.1	79.4	1	18.0	+44.8	79.5	1	28.9	+45.5	79.5	1	39.8	+46.2	79.5	1	50.7	+46.9	79.6
9	1	27.7	+42.7	78.7	1	39.4	+43.4	78.7	1	51.1	+44.2	78.8	2	02.8	+44.8	78.8	2	14.4	+45.5	78.8	2	26.0	+46.2	78.9	2	37.6	+46.8	78.9
10	2	10.4	+42.7	78.0	2	22.8	+43.5	78.0	2	35.3	+44.1	78.1	2	47.6	+44.8	78.1	2	59.9	+45.5	78.2	3	12.2	+46.1	78.2	3	24.4	+46.8	78.3
11	2	53.1	+42.7	77.3	3	06.3	+43.4	77.4	3	19.4	+44.1	77.4	3	32.4	+44.8	77.5	3	45.4	+45.5	77.5	3	58.3	+46.1	77.6	4	11.2	+46.7	77.7
12	3	35.8	+42.6	76.6	3	49.6	+43.4	76.7	4	03.5	+44.0	76.7	4	17.2	+44.7	76.8	4	30.9	+45.4	76.9	4	44.4	+46.1	77.0	5	11.4	+47.3	77.1
13	4	18.4	+42.6	75.9	4	33.0	+43.4	76.0	4	47.5	+44.0	76.0	5	01.9	+44.7	76.1	5	16.3	+45.3	76.2	5	30.5	+46.0	76.3	5	44.7	+46.6	76.4
14	5	01.0	+42.6	75.2	5	16.3	+43.3	75.3	5	31.5	+44.0	75.4	5	46.6	+44.7	75.5	6	01.6	+45.4	75.6	6	16.5	+46.0	75.7	6	31.3	+46.7	75.8
15	5	43.6	+42.5	74.5	5	59.6	+43.2	74.6	6	15.5	+43.9	74.7	6	31.3	+44.6	74.8	6	47.0	+45.2	74.9	7	02.5	+46.0	75.0	7	33.3	+47.2	75.3
16	6	26.1	+42.4	73.8	6	42.8	+43.1	73.9	6	59.4	+43.8	74.0	7	15.9	+44.5	74.1	7	32.2	+45.2	74.2	7	48.5	+45.8	74.4	8	04.6	+46.5	74.5
17	7	08.5	+42.4	73.1	7	25.9	+43.1	73.2	7	43.2	+43.8	73.3	8	00.4	+44.5	73.4	8	17.4	+45.2	73.6	8	34.3	+45.8	73.7	8	51.1	+46.4	73.9
18	7	50.9	+42.3	72.3	8	09.0	+43.0	72.5	8	27.0	+43.7	72.6	8	44.9	+44.4	72.8	9	02.6	+45.1	72.9	9	20.1	+45.8	73.1	9	37.5	+46.4	73.2
19	8	33.2	+42.2	71.6	8	52.0	+43.0	71.8	9	10.7	+43.7	71.9	9	29.3	+44.3	72.1	9	47.7	+45.0	72.2	10	05.9	+45.6	72.4	10	23.9	+46.3	72.6
20	9	15.4	+42.2	70.9	9	35.0	+42.8	71.1	9	54.4	+43.5	71.2	10	13.6	+44.2	71.4	10	32.7	+44.9	71.6	10	51.5	+45.6	71.7	11	10.2	+46.3	72.1
21	9	57.6	+42.0	70.2	10	17.8	+42.8	70.4	10	37.9	+43.5	70.5	10	57.8	+44.2	70.7	11	17.6	+44.8	70.9	11	37.1	+45.5	71.1	11	56.5	+46.1	71.3
22	10	39.6	+42.0	69.5	11	00.6	+42.6	69.6	11	21.4	+43.3	69.8	11	42.0	+44.0	70.0	12	02.4	+44.7	70.2	12	22.6	+45.4	70.4	12	42.6	+46.0	70.6
23	11	21.6	+41.8	68.7	11	43.2	+42.6	68.9	12	04.7	+43.3	69.1	12	26.0	+43.9	69.3	12	47.1	+44.6	69.5	13	08.0	+45.2	69.7	13	28.6	+46.0	70.0
24	12	03.4	+41.7	68.0	12	25.8	+42.4	68.2	12	48.0	+43.1	68.4	13	09.9	+43.9	68.6	13	31.7	+44.5	68.8	13	53.2	+45.2	69.1	14	14.6	+45.8	69.3
25	12	45.1	+41.6	67.3	13	08.2	+42.3	67.5	13	31.1	+43.0	67.7	13	53.8	+43.7	67.9	14	16.2	+44.4	68.2	14	38.4	+45.1	68.4	15	00.4	+45.7	68.6
26	13	26.7	+41.5	66.5	13	50.5	+42.2	66.7	14	14.1	+42.9	67.0	14	37.5	+43.5	67.2	15	00.6	+44.2	67.5	15	23.5	+44.9	67.7	15	46.1	+45.6	68.0
27	14	08.2	+41.3	65.8	14	32.7	+42.1	66.0	14	57.0	+42.7	66.3	15	21.0	+43.5	66.5	15	44.8	+44.1	66.8	16	31.7	+45.4	67.3	16	54.7	+46.1	67.6
28	14	49.5	+41.2	65.0	15	14.8	+41.8	65.3	15	39.7	+42.6	65.5	16	04.5	+43.2	65.8	16	28.9	+44.0	66.1	16	53.2	+44.6	66.3	17	17.1	+45.3	66.6
29	15	30.7	+41.1	64.3	15	56.6	+41.8	64.5	16	22.3	+42.5	64.8	16	47.7	+43.2	65.1	17	12.9	+43.8	65.3	18	02.4	+45.2	65.9	18	26.8	+45.8	66.2
30	16	11.8	+40.8	63.5	16	38.4	+41.6	63.8	17	04.8	+42.2	64.1	17	30.9	+43.0	64.3	17	56.7	+43.7	64.6	18	17.6	+44.3	64.9	18	47.6	+45.0	65.2
31	16	52.6	+40.7	62.8	17	20.0	+41.4	63.0	17	47.0	+42.2	63.3	18	13.9	+42.8	63.6	18	40.4	+43.5	63.9	19	06.6	+44.2	64.2	19	32.6	+44.8	64.9
32	17	33.3	+40.5	62.0	18	01.4	+41.2	62.3	18	29.2	+41.9	62.6	18	56.7	+42.6	62.9	19	23.9	+43.3	63.2	20	17.4	+44.7	63.8	20	43.8	+45.3	64.2
33	18	13.8	+40.4	61.2	18	42.6	+41.1	61.5	19	11.1	+41.7	61.8	19	39.3	+42.4	62.1	20	07.2	+43.1	62.4	21	21.2	+44.5	63.5	21	29.1	+45.2	63.5
34	18	54.2	+40.1	60.4	19	23.7	+40.8	60.7	19	52.8	+41.6	61.0	20	21.7	+42.3	61.4	20	50.3	+43.0	61.7	21	18.6	+43.7	62.0	22	14.3	+44.9	62.7
35	19	34.3	+39.9	59.6	20	04.5	+40.6	60.0	20	34.4	+41.3	60.3	21	04.0	+42.0	60.6	21	33.3	+42.7	60.9	22	02.3	+43.4	61.3	22	30.9	+44.1	61.7
36	20	14.2	+39.8	58.9	20	45.1	+40.5	59.2	21	15.7	+41.2	59.5	21	46.0	+41.9	59.8	22	16.0	+43.0	60.2	22	45.7	+43.2	60.6	23	44.0	+44.6	61.3
37	20	54.0	+39.4	58.0	21	25.6	+40.2	58.4	21	56.9	+40.9	58.7	22	27.9	+41.6	59.1	22	58.5	+42.3	59.4	23	28.9	+43.0	59.8	24	24.6	+43.4	59.4
38	21	33.4	+39.3	57.2	22	05.8	+39.9	57.6	22	37.8	+40.6	57.9	23	09.5	+41.3	58.3	23	40.8	+42.1	58.7	24	11.9	+42.8	59.0	25	12.9	+44.2	59.8
39	22	12.7	+39.0	56.4	23	29.4	+32.7	59.6	35	10.9	+33.4	60.1	35	56.7	+34.1	60.5	36	42.2	+34.7	60.8	37							

84°, 276° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180°Zn=Z
L.H.A. less than 180°Zn=360°-Z

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			Dec.								
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z									
0	4	14.3	+42.5	94.3	4	09.8	+43.3	94.3	4	05.3	+44.0	94.4	4	00.6	+44.7	94.5	3	55.9	+45.4	94.5	3	51.2	+46.0	94.6	3	46.3	+46.7	94.7	3	41.4	+47.4	94.7	0
1	4	56.8	+42.5	93.5	4	53.1	+43.2	93.6	4	49.3	+43.9	93.7	4	45.3	+44.7	93.8	4	41.3	+45.3	93.9	4	37.2	+46.0	94.0	4	33.0	+46.7	94.0	4	28.8	+47.3	94.1	1
2	5	39.3	+42.5	92.8	5	36.3	+43.2	92.9	5	33.2	+43.9	93.0	5	30.0	+44.6	93.1	5	26.6	+45.3	93.2	5	23.2	+46.0	93.3	5	19.7	+46.6	93.4	5	16.1	+47.3	93.5	2
3	6	21.8	+42.3	92.1	6	19.5	+43.1	92.2	6	17.1	+43.8	92.3	6	14.6	+44.5	92.5	6	11.9	+45.3	92.6	6	09.2	+45.9	92.7	6	06.3	+46.6	92.8	6	03.4	+47.2	92.9	3
4	7	04.1	+42.3	91.4	7	02.6	+43.0	91.5	7	00.9	+43.4	91.7	6	59.1	+44.5	91.8	6	57.2	+45.2	91.9	6	55.1	+45.9	92.0	6	52.9	+46.6	92.1	6	50.6	+47.2	92.3	4
5	7	46.4	+42.2	90.7	7	45.6	+43.0	90.8	7	44.7	+43.7	91.0	7	43.6	+44.4	91.1	7	42.4	+45.1	91.2	7	41.0	+45.8	91.4	7	39.5	+46.5	91.5	7	37.8	+47.2	91.6	5
6	8	28.6	+42.2	90.0	8	28.6	+42.9	90.1	8	28.4	+43.6	90.3	8	28.0	+44.4	90.4	8	27.5	+45.1	90.6	8	26.8	+45.8	90.7	8	26.0	+46.4	90.9	8	25.0	+47.1	91.0	6
7	9	10.8	+42.1	89.3	9	11.5	+42.8	89.4	9	12.0	+43.6	89.6	9	12.4	+44.2	89.7	9	12.6	+44.9	89.9	9	12.6	+45.7	90.1	9	12.1	+47.0	90.4	7				
8	9	52.9	+41.9	88.5	9	54.3	+42.7	88.7	9	55.6	+43.4	88.9	9	56.6	+44.2	89.1	9	57.5	+44.9	89.2	9	58.3	+45.6	89.4	9	58.8	+46.3	89.6	9	59.1	+47.0	89.8	8
9	10	34.8	+41.9	87.8	10	37.0	+42.7	88.0	10	39.0	+43.4	88.2	10	40.8	+44.1	88.4	10	42.4	+44.9	88.6	10	43.9	+45.5	88.7	10	45.1	+46.2	88.9	10	46.1	+46.9	89.1	9
10	11	16.7	+41.8	87.1	11	19.7	+42.5	87.3	11	22.4	+43.3	87.5	11	24.9	+44.0	87.7	11	27.3	+44.7	87.9	11	29.4	+45.4	88.1	11	31.3	+46.1	88.3	11	33.0	+46.8	88.5	10
11	11	58.5	+41.6	86.3	12	02.2	+42.4	86.6	12	05.7	+43.1	86.8	12	08.9	+43.9	87.0	12	12.0	+44.6	87.2	12	14.8	+45.3	87.4	12	17.4	+46.0	87.6	12	19.8	+46.7	87.9	11
12	12	40.1	+41.5	85.6	12	44.6	+42.3	85.8	12	48.8	+43.1	86.1	12	52.8	+43.8	86.3	13	00.1	+44.3	86.7	13	03.4	+46.0	87.0	13	06.5	+46.6	87.2	12				
13	13	21.6	+41.4	84.9	13	26.9	+42.2	85.1	13	31.9	+42.9	85.3	13	36.6	+43.7	85.6	13	41.1	+44.4	85.8	13	45.4	+45.1	86.1	13	49.4	+45.8	86.3	13	53.1	+46.5	86.6	13
14	14	03.0	+41.3	84.1	14	09.1	+42.0	84.4	14	14.8	+42.8	84.6	14	20.3	+43.5	84.9	14	25.5	+44.3	85.1	14	30.5	+45.0	85.4	14	35.2	+45.7	85.6	14	39.6	+46.4	85.9	14
15	14	44.3	+41.1	83.4	14	51.1	+41.9	83.6	14	57.6	+42.7	83.9	15	03.8	+43.5	84.2	15	09.8	+44.2	84.4	15	15.5	+44.9	84.7	15	20.9	+45.6	85.0	15	26.0	+46.3	85.3	15
16	15	25.4	+41.0	82.6	15	33.0	+41.7	82.9	15	40.3	+42.5	83.2	15	47.3	+43.2	83.5	15	54.0	+44.0	83.7	16	00.4	+44.7	84.0	16	06.5	+45.4	84.3	16	12.3	+46.1	84.6	16
17	16	06.4	+40.8	81.9	16	14.7	+41.6	82.1	16	22.8	+42.3	82.4	16	30.5	+43.1	82.7	16	38.0	+43.8	83.0	16	45.1	+44.6	83.3	16	51.9	+45.3	83.6	16	58.4	+46.1	83.9	17
18	16	47.2	+40.6	81.1	16	56.3	+41.4	81.4	17	05.1	+42.2	81.7	17	13.6	+43.0	82.0	17	21.8	+43.7	82.3	17	29.7	+44.4	82.6	17	37.2	+45.2	82.9	17	44.5	+45.8	83.3	18
19	17	27.8	+40.5	80.3	17	37.7	+41.3	80.6	17	47.3	+42.1	81.0	17	56.6	+42.8	81.3	18	05.5	+43.6	81.6	18	14.1	+44.3	81.9	18	22.4	+45.0	82.2	18	30.3	+45.8	82.6	19
20	18	08.3	+40.2	79.5	18	19.0	+41.0	79.9	18	29.4	+41.8	80.2	18	39.4	+42.6	80.5	18	49.1	+43.4	80.9	18	58.4	+44.2	81.2	19	17.1	+45.6	81.9	20				
21	18	48.5	+40.1	78.8	19	00.0	+40.9	79.1	19	11.2	+41.7	79.4	19	22.0	+42.5	79.8	19	32.5	+43.2	80.1	19	42.6	+43.9	80.5	19	52.3	+44.7	80.8	20	01.7	+45.4	81.2	21
22	19	28.6	+39.8	78.0	19	40.9	+40.7	78.3	19	52.9	+41.4	78.7	20	24.5	+42.2	79.0	20	15.7	+43.0	79.4	20	26.5	+43.8	79.8	20	37.0	+44.5	80.1	20	47.1	+45.3	80.5	22
23	20	08.4	+39.7	77.2	20	21.6	+40.4	77.5	20	34.3	+41.3	77.9	20	46.7	+42.0	78.3	20	58.7	+42.8	78.7	21	10.3	+43.6	79.0	21	21.5	+44.4	79.4	21	32.4	+45.0	79.8	23
24	20	48.1	+39.4	76.4	21	02.0	+40.3	76.8	21	15.6	+41.0	77.1	21	28.7	+41.9	77.5	21	41.5	+42.6	77.9	21	53.9	+43.4	78.3	22	05.9	+44.1	78.7	22	17.4	+44.9	79.1	24
25	21	27.5	+39.2	75.6	21	42.3	+40.0	76.0	21	56.6	+40.8	76.3	22	10.6	+41.6	76.7	22	24.1	+42.4	77.1	22	37.3	+43.2	77.5	22	50.0	+44.0	78.0	23	02.3	+44.7	78.4	25
26	22	06.7	+38.9	74.8	22	22.3	+39.7	75.2	22	37.4	+40.6	75.6	22	52.2	+41.4	76.0	23	06.5	+42.2	76.4	23	20.5	+42.9	76.8	23	34.0	+43.7	77.2	23	47.0	+44.5	77.6	26
27	22	45.6	+38.7	73.9	23	02.0	+39.5	74.3	23	18.0	+40.3	74.8	23	33.6	+41.1	75.2	23	48.7	+41.9	75.6	24	03.4	+42.7	76.0	24	17.7	+43.5	76.5	24	31.5	+44.3	76.9	27
28	23	24.3	+38.4	73.1	23	41.5	+39.3	73.5	23	58.3	+40.1	73.9	24	14.7	+40.9	74.4	24	30.6	+41.7	74.8	24	46.1	+42.5	75.3	25	01.2	+43.3	75.7	25	15.8	+44.0	76.2	28
29	24	02.7	+38.2	72.3	24	20.8	+39.0	72.7	24	38.4	+39.8	73.1	24	55.6	+40.6	73.6	25	25.8	+42.3	74.5	25	44.5	+43.0	74.9	25	58.9	+43.8	75.4	29				
30	24	40.9	+37.8	71.4	24	59.8	+38.6	71.9	25	18.2	+39.5	72.3	25	36.2	+40.4	72.8	25	53.8	+41.2	73.2	26	10.9	+41.9	73.7	26	27.5	+42.8	74.2	26	43.6	+43.6	74.6	30
31	25	18.7	+37.6	70.6	25	38.4	+38.4	71.0	25	57.7	+39.3	71.5	26	16.6	+40.0	71.9	26	35.0	+40.8	72.4	26	52.8	+41.7	72.9	27	10.3	+42.5	73.4	27	27.2	+43.3	73.9	31
32	25	56.3	+37.2	69.7	26	16.8	+38.1	70.2	26	37.0	+38.9	70.6	26	56.6	+39.6	71.0	27	15.8	+40.6	71.6	27	34.5	+41.5	72.1	27	53.5	+42.7	72.3	33				
33	26	33.5	+36.9	68.8	26	54.9	+37.8	69.3	27	15.9	+38.6	69.8	28	36.7	+30.0	69.9	29	57.1	+40.8	70.4	28	16.0	+41.1	71.3	28	35.0	+41.9	71.8	29	36.2	+42.5	71.5	34
34	27	47.0	+36.2	67.0	28	10.1	+37.1	67.5	28	32.8																							

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 84° , 276°

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			Dec.	
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z		
0	4 14.3 -42.5	94.3	4 09.8 -43.3	94.3	4 05.3 -44.0	94.4	4 00.6 -44.7	94.5	3 55.9 -45.4	94.5	3 51.2 -46.1	94.6	3 46.3 -46.7	94.7	3 41.4 -47.4	94.7	3 36.0 -48.1	94.7	3 31.1 -47.4	97.2	3 25.4 -47.4	95.3	3			
1	3 31.8 -42.6	95.0	3 26.5 -43.3	95.0	3 21.3 -44.1	95.1	3 15.9 -44.7	95.1	3 10.5 -45.4	95.2	3 05.1 -46.1	95.2	2 59.6 -46.8	95.3	2 54.0 -47.4	95.3	2 49.2 -47.4	95.3	2 44.0 -47.4	95.3	2 39.0 -47.4	95.3	2 34.0 -47.4	95.3	1	
2	2 49.2 -42.6	95.7	2 43.2 -43.3	95.7	2 37.2 -44.0	95.8	2 31.2 -44.8	95.8	2 25.1 -45.4	95.8	2 19.0 -46.1	95.9	2 12.8 -46.8	95.9	2 06.6 -47.4	96.0	2 01.4 -47.4	96.0	1 50.6 -47.4	96.0	1 45.4 -47.4	96.0	1 40.2 -47.4	96.0	3	
3	2 06.6 -42.7	96.4	1 59.9 -43.4	96.4	1 53.2 -44.1	96.4	1 46.4 -44.7	96.5	1 39.7 -45.5	96.5	1 32.9 -46.2	96.5	1 26.0 -46.8	96.6	1 19.2 -47.5	96.6	1 14.4 -47.5	96.6	1 09.6 -47.5	96.6	1 04.8 -47.5	96.6	1 00.0 -47.5	96.6	4	
4	1 23.9 -42.6	97.1	1 16.5 -43.4	97.1	1 09.1 -44.1	97.1	1 01.7 -44.8	97.1	0 46.7 -45.4	97.2	0 40.6 -46.1	97.2	0 35.2 -46.8	97.2	0 31.1 -47.4	97.2	0 27.4 -47.4	97.2	0 23.4 -47.4	97.2	0 19.2 -47.4	97.2	0 15.1 -47.4	97.2	4	
5	0 41.3 -42.7	97.8	0 33.1 -43.3	97.8	0 25.0 -44.1	97.8	0 16.9 -44.8	97.8	0 08.7 -45.4	97.8	0 00.6 -46.2	97.8	0 07.6 +46.8	82.2	0 15.7 +47.4	82.2	0 54.4 +46.7	81.6	1 03.1 +47.5	81.6	1 41.1 +46.8	80.9	1 22.2 +45.8	80.9	1 0	
6	0 01.4 +42.6	81.5	0 10.2 +43.4	81.5	0 19.1 +44.1	81.5	0 27.9 +44.8	81.5	0 36.7 +45.5	81.5	0 45.6 +46.1	81.6	0 54.4 +46.7	81.6	1 03.1 +47.5	81.6	1 41.1 +46.8	80.9	1 20.6 +47.4	81.0	1 0	2 27.4 +46.8	80.3	2 38.0 +47.4	80.4	8
7	0 44.0 +42.7	80.8	0 53.6 +43.4	80.8	1 03.2 +44.0	80.9	1 12.7 +44.8	80.9	1 22.2 +45.5	80.9	1 31.7 +46.1	80.9	2 07.7 +45.4	80.2	2 17.8 +46.1	80.3	2 27.9 +46.8	80.3	1 50.6 +47.4	81.0	1 27.4 +47.4	81.0	1 13.7 +47.4	81.0	7	
8	1 26.7 +42.6	80.1	1 37.0 +43.3	80.1	1 47.4 +44.1	80.2	1 57.5 +44.7	80.2	2 03.7 +45.4	80.2	2 17.8 +46.1	80.3	3 14.7 +46.7	79.7	3 25.4 +47.4	79.7	3 25.4 +47.4	79.7	3 14.7 +46.7	79.7	3 14.7 +46.7	79.7	9			
9	2 09.3 +42.7	79.4	2 20.3 +43.4	79.5	2 31.3 +44.0	79.5	2 42.2 +44.8	79.5	2 53.1 +45.4	79.6	3 03.9 +46.1	79.6	3 38.5 +45.4	78.9	3 50.0 +46.0	79.0	4 01.4 +46.7	79.1	4 12.8 +47.3	79.1	4 48.1 +46.7	78.4	5 00.1 +47.3	78.5	11	
10	2 52.0 +42.5	78.7	3 03.7 +43.3	78.8	3 15.3 +44.1	78.8	3 27.0 +44.7	78.9	3 38.5 +45.4	78.9	3 50.0 +46.0	79.0	4 23.9 +45.3	78.3	4 36.0 +46.1	78.4	5 34.8 +46.6	77.8	5 47.4 +47.3	77.9	1 22.3 +46.6	77.7	1 12.8 +46.6	77.7	12	
11	3 34.5 +42.6	78.0	3 47.0 +43.3	78.1	3 59.4 +43.9	78.1	4 11.7 +44.6	78.2	5 09.2 +45.4	77.6	5 22.1 +45.9	77.7	6 21.4 +46.6	77.2	6 34.7 +47.2	77.3	1 21.9 +46.6	77.3	1 11.7 +46.6	77.3	1 0	2 21.9 +47.2	76.7	1 21.9 +47.2	76.7	13
12	4 17.1 +42.5	77.3	4 30.3 +43.2	77.4	4 43.3 +44.0	77.4	4 56.3 +44.7	77.4	5 09.2 +45.4	77.6	5 22.1 +45.9	77.7	6 21.4 +46.6	77.2	6 34.7 +47.2	77.3	1 21.9 +46.6	77.3	1 11.7 +46.6	77.3	1 0	2 21.9 +47.2	76.7	1 21.9 +47.2	76.7	14
13	4 59.6 +42.5	76.6	5 13.5 +43.2	76.7	5 27.3 +43.9	76.8	5 41.0 +44.6	76.9	5 54.6 +45.2	77.0	6 08.0 +46.0	77.1	6 39.8 +45.2	76.3	6 54.0 +45.9	76.4	7 08.0 +46.5	76.5	7 21.9 +47.2	76.7	7 21.9 +47.2	76.7	7 21.9 +47.2	76.7	14	
14	5 42.1 +42.4	75.9	5 56.7 +43.1	76.0	6 11.2 +43.8	76.1	6 25.6 +44.5	76.2	6 39.8 +45.2	76.3	6 54.0 +45.9	76.4	7 08.0 +46.5	76.5	7 21.9 +47.2	76.7	7 21.9 +47.2	76.7	7 21.9 +47.2	76.7	7 21.9 +47.2	76.7	14			
15	6 24.5 +42.4	75.2	6 39.8 +43.1	75.3	6 55.0 +43.8	75.4	7 10.1 +44.5	75.5	7 25.0 +45.2	75.6	7 39.9 +45.8	75.8	7 54.5 +46.5	75.9	8 09.1 +47.1	76.0	8 45.4 +46.5	76.0	8 41.0 +46.4	75.3	8 56.2 +47.1	75.4	16			
16	7 06.9 +42.3	74.5	7 22.9 +43.0	74.6	7 38.3 +43.7	74.7	7 54.6 +44.4	74.8	8 10.2 +45.1	75.0	8 25.7 +45.7	75.1	9 27.4 +46.4	74.6	9 43.3 +46.9	74.8	10 30.2 +46.9	74.1	10 23.9 +46.4	70.9	10 23.9 +46.4	70.9	10 23.9 +46.4	70.9	23	
17	7 49.2 +42.2	73.7	8 05.9 +43.0	73.9	8 22.5 +43.7	74.0	8 39.0 +44.3	74.2	8 55.3 +45.0	74.3	9 11.4 +45.7	74.5	10 25.2 +44.9	73.0	10 42.7 +45.5	73.1	11 00.0 +46.2	73.3	11 17.1 +46.9	73.5	11 17.1 +46.9	73.5	11 17.1 +46.9	73.5	19	
18	8 31.4 +42.1	73.0	8 48.9 +42.8	73.2	9 06.2 +43.5	73.3	9 23.3 +44.3	73.5	9 40.3 +44.9	73.6	9 57.1 +45.6	73.8	10 13.8 +46.2	74.0	10 30.2 +46.9	74.1	10 30.2 +46.9	74.1	10 30.2 +46.9	74.1	10 30.2 +46.9	74.1	18			
19	9 13.5 +42.1	72.3	9 31.7 +42.8	72.5	9 49.7 +43.5	72.6	10 07.6 +44.1	72.8	10 25.2 +44.9	73.0	10 42.7 +45.5	73.1	11 00.0 +46.2	73.3	11 17.1 +46.9	73.5	11 17.1 +46.9	73.5	11 17.1 +46.9	73.5	11 17.1 +46.9	73.5	19			
20	9 55.6 +42.0	71.6	10 14.5 +42.7	71.7	10 33.2 +43.4	71.9	10 51.7 +44.1	72.1	11 10.1 +44.7	72.3	11 28.2 +45.5	72.5	11 46.2 +46.1	72.7	12 04.0 +46.7	72.9	12 04.0 +46.7	72.9	12 04.0 +46.7	72.9	12 04.0 +46.7	72.9	20			
21	10 37.6 +41.8	70.9	10 57.2 +42.5	71.0	11 16.6 +43.3	71.2	11 35.8 +44.0	71.4	11 54.8 +44.7	71.6	12 13.7 +45.3	71.8	12 32.3 +46.0	72.0	12 50.7 +46.7	72.2	12 50.7 +46.7	72.2	12 50.7 +46.7	72.2	12 50.7 +46.7	72.2	21			
22	11 19.4 +41.8	70.1	11 39.7 +42.5	70.3	11 59.9 +43.1	70.5	12 19.8 +43.9	70.7	12 39.5 +45.5	70.9	12 59.0 +45.2	71.1	13 18.3 +45.9	71.4	13 37.4 +46.5	71.6	13 37.4 +46.5	71.6	13 37.4 +46.5	71.6	13 37.4 +46.5	71.6	22			
23	12 01.2 +41.6	69.4	12 22.2 +42.4	69.6	12 43.0 +43.1	69.8	13 03.7 +43.7	70.0	13 24.1 +44.4	70.2	13 44.2 +45.2	70.5	14 04.2 +45.8	70.7	14 23.9 +46.4	70.9	14 23.9 +46.4	70.9	14 23.9 +46.4	70.9	14 23.9 +46.4	70.9	23			
24	12 42.8 +41.6	68.7	13 04.6 +42.2	68.9	13 26.1 +42.9	69.1	13 47.4 +43.7	69.3	14 08.5 +44.3	69.5	14 29.4 +45.0	69.7	15 21.1 +45.7	69.9	15 40.5 +45.6	70.3	15 40.5 +45.6	70.3	15 40.5 +45.6	70.3	15 40.5 +45.6	70.3	24			
25	13 24.4 +41.3	67.9	13 46.8 +42.1	68.1	14 09.0 +42.9	68.4	14 31.1 +43.5	68.6	14 52.8 +44.2	68.8	15 14.4 +44.8	69.1	15 37.0 +44.1	69.4	15 59.2 +44.8	69.4	15 59.2 +44.8	69.4	15 59.2 +44.8	69.4	15 59.2 +44.8	69.4	25			
26	14 05.7 +41.3	67.2	14 28.9 +42.0	67.4	14 51.9 +42.6	67.6	15 14.9 +43.6	67.9	15 37.0 +44.1	68.1	15 59.2 +44.8	68.4	16 21.2 +45.4	68.7	16 42.9 +46.0	69.0	16 42.9 +46.0	69.0	16 42.9 +46.0	69.0	16 42.9 +46.0	69.0	25			
27	14 47.0 +41.1	66.4	15 10.9 +41.8	66.7	15 34.5 +42.6	66.9	15 57.9 +43.3	67.2	16 21.1 +43.9	67.4	16 44.0 +44.6	67.7	17 06.6 +45.3	68.0	17 28.9 +46.0	68.3	17 28.9 +46.0	68.3	17 28.9 +46.0	68.3	17 28.9 +46.0	68.3	27			
28	15 28.1 +40.9	65.7	15 52.7 +41.7	65.9	16 17.1 +42.4	66.2	17 20.4 +42.2	66.7	18 42.2 +42.9	67.7	19 42.2 +43.6	68.1	20 06.3 +44.6	68.4	20 06.8 +44.6	68.5	20 06.8 +44.6	68.5	20 06.8 +44.6	68.5	20 06.8 +44.6	68.5	30			
29	15 31.2 +40.8	65.0	16 21.3 +40.6	65.3	17 20.8 +41.3	65.6	18 28.8 +41.8	65.9	19 52.0 +42.5	66.2	20 22.0 +43.2	66.5	21 25.1 +43.9	66.8	22 48.1 +43.7	67.1	22 48.1 +43.7	67.1	22 48.1 +43.7	67.1	22 48.1 +43.7	67.1	35			
30	16 36.9 +39.4	64.5	17 28.6 +39.4	64.8	18 22.8 +39.4	65.1	19 37.8 +39.6	65.3	20 10.4 +39.8	65.5	21 37.9 +40.5	65.8	22 36.2 +43.2	66.1	23 40.2 +43.9	66.3	23 40.2 +43.9	66.3	23 40.2 +43.9	66.3	23 40.2 +43.9	66.3	35			
31	17 20.9 +39.1	63.8	18 43.6 +39.1	64.2	19 30.2 +39.3	64.4	20 10.6 +39.4	64.6	21 37.8 +39.6	64.9																

85°, 275° L.H.A.

LATITUDE SAME NAME AS DECLINATION

{ L.H.A. greater than 180°Zn=Z
N. Lat. { L.H.A. less than 180°Zn=360°-Z }

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			Dec.	
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z		
0	3 32.0 +42.5	93.5	3 28.3 +43.2	93.6	3 24.5 +43.9	93.7	3 20.6 +44.6	93.7	3 16.7 +45.3	93.8	3 12.7 +46.0	93.8	3 08.7 +46.6	93.9	3 04.6 +47.3	93.9	0	0	0	0	0	0	0	0	0	
1	4 14.5 +42.4	92.8	4 11.5 +43.2	92.9	4 08.4 +43.9	93.0	4 05.2 +44.7	93.1	4 02.0 +45.3	93.1	3 58.7 +46.0	93.2	3 55.3 +46.7	93.3	3 51.9 +47.3	93.3	1	1	1	1	1	1	1	1	1	
2	4 56.9 +42.4	92.1	4 54.7 +43.1	92.2	4 52.3 +43.9	92.3	4 49.9 +44.5	92.4	4 47.3 +45.3	92.5	4 44.7 +46.0	92.5	4 42.0 +46.6	92.6	4 39.2 +47.3	92.7	2	2	2	2	2	2	2	2	2	
3	5 39.3 +42.4	91.4	5 37.8 +43.1	91.5	5 36.2 +43.8	91.6	5 34.4 +44.6	91.7	5 32.6 +45.2	91.8	5 30.7 +45.9	91.9	5 28.6 +46.6	92.0	5 26.5 +47.2	92.1	3	3	3	3	3	3	3	3	3	
4	6 21.7 +42.3	90.7	6 20.9 +43.0	90.8	6 20.0 +43.8	90.9	6 19.0 +44.5	91.0	6 17.8 +45.2	91.1	6 16.6 +45.9	91.3	6 15.2 +46.5	91.4	6 13.7 +47.2	91.5	4	4	4	4	4	4	4	4	4	
5	7 04.0 +42.2	90.0	7 03.9 +43.0	90.1	7 03.8 +43.7	90.2	7 03.5 +44.4	90.4	7 03.0 +45.1	90.5	7 02.4 +45.9	90.6	7 01.7 +46.5	90.7	7 00.9 +47.2	90.9	5	5	5	5	5	5	5	5	5	
6	7 46.2 +42.2	89.3	7 46.9 +42.9	89.4	7 47.5 +43.6	89.5	7 47.9 +44.3	89.7	7 48.1 +45.1	89.8	7 48.3 +45.7	90.0	7 48.2 +46.5	90.1	7 48.1 +47.1	90.2	6	6	6	6	6	6	6	6	6	
7	8 28.4 +42.1	88.6	8 29.8 +42.8	88.7	8 31.1 +43.6	88.9	8 32.2 +44.3	89.0	8 33.2 +45.0	89.2	8 34.0 +45.7	89.3	8 34.7 +46.3	89.5	8 35.2 +47.0	89.6	7	7	7	7	7	7	7	7	7	
8	9 10.5 +42.0	87.8	9 12.6 +42.8	88.0	9 14.7 +43.4	88.2	9 16.5 +44.2	88.3	9 18.2 +44.9	88.5	9 19.7 +45.4	88.6	9 21.0 +46.3	88.8	9 22.2 +47.0	89.0	8	8	8	8	8	8	8	8	8	
9	9 52.5 +41.9	87.1	9 55.4 +42.6	87.3	9 58.1 +43.4	87.5	10 00.7 +44.1	87.6	10 03.1 +44.8	87.8	10 05.3 +45.5	88.0	10 07.3 +46.2	88.2	10 09.2 +46.8	88.3	9	9	9	9	9	9	9	9	9	
10	10 34.4 +41.8	86.4	10 38.0 +42.6	86.6	10 41.5 +43.3	86.8	10 44.8 +44.1	86.9	10 47.9 +44.8	87.1	10 50.8 +45.5	87.3	10 53.5 +46.2	87.5	10 56.0 +46.9	87.7	10	10	10	10	10	10	10	10	10	
11	11 16.2 +41.6	85.6	11 20.6 +42.5	85.8	11 24.8 +43.2	86.0	11 28.9 +43.9	86.2	11 32.7 +44.6	86.5	11 36.3 +45.4	86.7	11 39.7 +46.0	86.9	11 42.9 +46.7	87.1	11	11	11	11	11	11	11	11	11	
12	11 57.8 +41.6	84.9	12 03.1 +42.3	85.1	12 08.0 +43.1	85.3	12 12.8 +43.8	85.6	12 17.3 +44.6	85.8	12 21.7 +45.2	86.0	12 25.7 +46.0	86.2	12 29.6 +46.6	86.4	12	12	12	12	12	12	12	12	12	
13	12 39.4 +41.5	84.2	12 45.4 +42.2	84.4	12 51.1 +43.0	84.6	12 56.6 +43.7	84.9	13 01.9 +44.4	85.1	13 06.9 +45.2	85.3	13 11.7 +45.8	85.5	13 16.2 +46.6	85.8	13	13	13	13	13	13	13	13	13	
14	13 20.9 +41.3	83.4	13 27.6 +42.1	83.7	13 34.1 +42.8	83.9	13 40.3 +43.6	84.2	13 46.3 +44.4	84.4	13 52.1 +45.0	84.6	13 57.5 +45.8	84.9	14 02.8 +46.4	85.1	14	14	14	14	14	14	14	14	14	
15	14 02.2 +41.2	82.7	14 09.7 +42.0	82.9	14 16.9 +42.8	83.2	14 23.9 +43.5	83.4	14 30.7 +44.2	83.7	14 37.1 +44.9	84.0	14 43.3 +45.6	84.2	14 49.2 +46.3	84.5	15	15	15	15	15	15	15	15	15	
16	14 43.4 +41.0	81.9	14 51.7 +41.8	82.2	14 59.7 +42.5	82.5	15 07.4 +43.3	82.7	15 14.9 +44.0	83.0	15 22.0 +44.8	83.3	15 28.9 +45.5	83.5	15 35.5 +46.2	83.8	16	16	16	16	16	16	16	16	16	
17	15 24.4 +40.9	81.2	15 33.5 +41.6	81.5	15 42.2 +42.5	81.7	15 50.7 +43.2	82.0	15 58.9 +44.0	82.3	16 06.8 +44.7	82.6	16 14.4 +45.4	82.9	16 21.7 +46.1	83.2	17	17	17	17	17	17	17	17	17	
18	16 05.3 +40.7	80.4	16 15.1 +41.5	80.7	16 24.7 +42.3	81.0	16 33.9 +43.1	81.3	16 42.9 +43.7	81.6	16 51.5 +44.5	81.9	16 59.8 +45.2	82.2	17 07.8 +45.9	82.5	18	18	18	18	18	18	18	18	18	
19	16 46.0 +40.6	79.7	16 56.6 +41.4	80.0	17 07.0 +42.1	80.3	17 17.0 +42.8	80.6	17 26.6 +43.7	80.9	17 36.0 +44.4	81.2	17 45.0 +45.1	81.5	17 53.7 +45.9	81.8	19	19	19	19	19	19	19	19	19	
20	17 26.6 +40.4	78.9	17 38.0 +41.2	79.2	17 49.1 +41.9	79.5	17 59.8 +42.7	79.8	18 10.3 +43.4	80.1	18 20.4 +44.2	80.5	18 30.1 +45.0	80.8	18 39.6 +45.6	81.1	20	20	20	20	20	20	20	20	20	
21	18 07.0 +40.1	78.1	18 19.2 +40.9	78.4	18 31.0 +41.8	78.8	18 42.5 +42.6	79.1	18 53.7 +43.3	79.4	19 04.6 +44.0	79.8	19 15.1 +44.7	80.1	19 25.2 +45.5	80.4	21	21	21	21	21	21	21	21	21	
22	18 47.1 +40.0	77.3	19 00.1 +40.8	77.7	19 12.8 +41.6	78.0	19 25.1 +42.3	78.3	19 37.0 +43.2	78.7	19 48.6 +43.9	79.0	19 59.8 +44.7	79.4	20 10.7 +45.3	79.8	22	22	22	22	22	22	22	22	22	
23	19 27.1 +39.8	76.5	19 40.9 +40.6	76.9	19 54.4 +41.3	77.2	20 07.4 +42.2	77.6	20 20.2 +42.9	77.9	20 32.5 +43.7	78.3	20 44.5 +44.4	78.7	20 56.0 +45.2	79.1	23	23	23	23	23	23	23	23	23	
24	20 06.9 +39.6	75.7	20 21.5 +40.4	76.1	20 35.7 +41.2	76.5	20 49.6 +42.0	76.8	21 03.1 +42.7	77.2	21 16.2 +43.5	77.6	21 28.9 +44.2	78.0	21 41.2 +45.0	78.3	24	24	24	24	24	24	24	24	24	
25	20 46.5 +39.3	74.9	21 01.9 +40.1	75.3	21 16.9 +41.0	75.7	21 31.6 +41.7	76.1	21 45.8 +42.5	76.4	21 59.7 +43.3	76.8	22 13.1 +44.1	77.2	22 26.2 +44.8	77.6	25	25	25	25	25	25	25	25	25	
26	21 25.8 +39.1	74.1	21 42.0 +39.9	74.5	21 57.9 +40.7	74.9	22 13.3 +41.5	75.3	22 28.3 +42.3	75.7	22 43.0 +43.0	76.1	22 57.2 +43.8	76.5	23 11.0 +44.8	76.9	26	26	26	26	26	26	26	26	26	
27	22 04.9 +38.9	73.3	22 21.9 +39.7	73.7	22 38.6 +40.5	74.1	22 54.8 +41.3	74.5	23 10.6 +42.1	74.9	23 26.0 +42.9	75.3	23 41.0 +43.6	75.8	23 55.6 +44.4	76.2	27	27	27	27	27	27	27	27	27	
28	22 43.8 +38.6	72.5	23 01.6 +39.5	72.9	23 19.1 +40.2	73.3	23 36.1 +41.1	73.7	23 52.7 +41.9	74.1	24 08.9 +42.6	74.6	24 24.6 +43.5	75.0	24 40.0 +44.1	75.4	28	28	28	28	28	28	28	28	28	
29	23 22.4 +38.3	71.7	23 41.1 +39.1	72.1	23 59.3 +40.0	72.5	24 21.2 +40.7	72.9	24 34.6 +41.6	73.4	24 51.5 +42.4	73.8	25 08.1 +43.1	74.2	25 24.1 +44.0	74.7	29	29	29	29	29	29	29	29	29	
30	24 00.7 +38.1	70.8	24 20.2 +38.9	71.2	24 39.3 +39.7	71.7	24 58.0 +40.5	72.1	25 16.2 +41.3	72.6	25 33.9 +42.2	73.0	25 51.2 +42.9	73.5	26 08.1 +43.6	73.9	30	30	30	30	30	30	30	30	30	
31	24 38.8 +37.7	70.0	24 59.1 +38.6	70.4	25 19.0 +39.5	70.8	25 38.5 +40.2	71.3	25 57.5 +41.1	71.8	26 16.1 +41.8	72.2	26 34.1 +42.7	72.7	26 51.7 +43.5	73.2	31	31	31	31	31	31	31	31	31	
32	25 16.5 +37.5	69.1	25 37.7 +38.3	69.6	25 58.5 +39.1	70.0	26 18.7 +40.0	70.5	26 38.6 +38.0	70.9	26 57.9 +41.6	71.4	27 39.5 +43.1	70.6	27 59.2 +42.1	71.1	28 18.4 +42.9	71.6	33	33	33	33	33	33	33	33
33	25 50.4 +37.2	68.2	26 16.0 +38.0	68.7	26 37.6 +38.8	69.2	26 58.7 +39.3	69.6	27 19.4 +39.7	70.3	28 0.9 +39.9	68.4	29 01.8 +40.7	69.0	29 23.1 +41.5	69.5	29 43.9 +42.3	70.0	35	35	35	35	35	35	35	35
34	26 31.4 +36.8	67.4	26 54.0 +37.7	67.8	27 16.4 +38.6	68.3	27 38.4 +39.3	68.8	28 56.8 +30.6	69.4	29 34.8 +31.5	69.1	30 12.2 +32.4	70.1	30 49.1 +33.3	72.4	41 25.4 +34.2	73								

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 85°, 275°

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			Dec.
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	
0	3 32.0 -42.5	93.5	3 28.3 -43.3	93.6	3 24.5 -44.0	93.7	3 20.6 -44.7	93.7	3 16.7 -45.4	93.8	3 12.7 -46.1	93.8	3 08.7 -46.8	93.9	3 04.6 -47.4	93.9	3 04.6 -47.4	93.9	3 04.6 -47.4	93.9	3 04.6 -47.4	93.9	0		
1	2 49.5 -42.6	94.2	2 45.0 -43.3	94.3	2 40.5 -44.0	94.3	2 35.9 -44.7	94.4	2 31.3 -45.4	94.4	2 26.6 -46.0	94.5	2 21.9 -46.7	94.5	2 17.2 -47.4	94.6	2 17.2 -47.4	94.6	2 17.2 -47.4	94.6	2 17.2 -47.4	94.6	1		
2	2 06.9 -42.5	95.0	2 01.7 -43.3	95.0	1 56.5 -44.0	95.0	1 51.2 -44.7	95.1	1 45.9 -45.4	95.1	1 40.6 -46.1	95.1	1 35.2 -46.7	95.1	1 29.8 -47.4	95.2	1 29.8 -47.4	95.2	1 29.8 -47.4	95.2	1 29.8 -47.4	95.2	3		
3	1 24.4 -42.6	95.7	1 18.4 -43.3	95.7	1 12.5 -44.0	95.7	1 06.5 -44.7	95.7	1 00.5 -45.4	95.7	0 54.5 -46.1	95.8	0 48.5 -46.8	95.8	0 42.4 -47.4	95.8	0 42.4 -47.4	95.8	0 42.4 -47.4	95.8	0 42.4 -47.4	95.8	3		
4	0 41.8 -42.6	96.4	0 35.1 -43.3	96.4	0 28.5 -44.1	96.4	0 21.8 -44.7	96.4	0 15.1 -45.4	96.4	0 0.8 -46.1	96.4	0 0.1 -46.7	96.4	0 0.50.0 +4.7	83.6	0 0.50.0 +4.7	83.6	0 0.50.0 +4.7	83.6	0 0.50.0 +4.7	83.6	4		
5	0 00.8 +42.6	82.9	0 08.2 +43.3	82.9	0 15.6 +44.0	82.9	0 22.9 +44.8	82.9	0 30.3 +45.4	83.0	0 37.7 +46.0	83.0	0 45.0 +46.7	83.0	0 52.3 +47.4	83.0	0 52.3 +47.4	83.0	0 52.3 +47.4	83.0	0 52.3 +47.4	83.0	5		
6	0 43.4 +42.6	82.2	0 51.5 +43.3	82.2	0 59.6 +44.0	82.3	1 07.7 +44.7	82.3	1 15.7 +45.4	82.3	1 23.7 +46.1	82.3	1 31.7 +46.8	82.3	1 39.7 +47.4	82.4	1 39.7 +47.4	82.4	1 39.7 +47.4	82.4	1 39.7 +47.4	82.4	6		
7	1 26.0 +42.5	81.5	1 34.8 +43.3	81.6	1 43.6 +44.0	81.6	1 52.4 +44.7	81.6	2 01.1 +45.4	81.6	2 09.8 +46.1	81.7	2 18.5 +46.7	81.7	2 27.1 +47.4	81.8	2 27.1 +47.4	81.8	2 27.1 +47.4	81.8	2 27.1 +47.4	81.8	7		
8	2 08.5 +42.6	80.8	2 18.1 +43.3	80.9	2 27.6 +44.0	80.9	2 37.1 +44.6	80.9	2 46.5 +45.4	81.0	2 55.9 +46.0	81.0	3 05.2 +46.7	81.1	3 14.5 +47.3	81.1	3 14.5 +47.3	81.1	3 14.5 +47.3	81.1	3 14.5 +47.3	81.1	8		
9	2 51.1 +42.5	80.1	3 01.4 +43.2	80.2	3 11.6 +43.9	80.2	3 21.7 +44.7	80.3	3 31.9 +45.3	80.3	3 41.9 +46.0	80.4	3 51.9 +46.6	80.5	4 01.8 +47.3	80.5	4 01.8 +47.3	80.5	4 01.8 +47.3	80.5	4 01.8 +47.3	80.5	9		
10	3 33.6 +42.5	79.4	3 44.6 +43.2	79.5	3 55.5 +44.0	79.5	4 06.4 +44.6	79.6	4 17.2 +45.3	79.7	4 27.9 +46.0	79.8	4 38.5 +46.7	79.8	4 49.1 +47.3	79.9	4 49.1 +47.3	79.9	4 49.1 +47.3	79.9	4 49.1 +47.3	79.9	10		
11	4 16.1 +42.4	78.7	4 27.8 +43.2	78.8	4 39.5 +43.8	78.9	4 51.0 +44.6	78.9	5 02.5 +45.2	79.0	5 13.9 +45.9	79.1	5 25.2 +46.6	79.2	5 36.4 +47.2	79.3	5 36.4 +47.2	79.3	5 36.4 +47.2	79.3	5 36.4 +47.2	79.3	11		
12	4 58.5 +42.4	78.0	5 11.0 +43.1	78.1	5 23.3 +43.9	78.2	5 35.6 +44.5	78.3	5 47.7 +45.3	78.4	5 59.8 +45.9	78.5	6 11.8 +46.5	78.6	6 23.6 +47.2	78.7	6 23.6 +47.2	78.7	6 23.6 +47.2	78.7	6 23.6 +47.2	78.7	12		
13	5 40.9 +42.4	77.3	5 54.1 +43.1	77.4	6 07.2 +43.8	77.5	6 20.1 +44.5	77.6	6 33.0 +45.1	77.7	6 45.7 +45.8	77.8	6 58.3 +46.5	77.9	7 10.8 +47.1	78.1	7 10.8 +47.1	78.1	7 10.8 +47.1	78.1	7 10.8 +47.1	78.1	13		
14	6 23.3 +42.3	76.6	6 37.2 +43.0	76.7	6 51.0 +43.7	76.8	7 04.6 +44.4	76.9	7 18.1 +45.1	77.0	7 31.5 +45.8	77.2	7 44.8 +46.4	77.3	7 57.9 +47.1	77.4	7 57.9 +47.1	77.4	7 57.9 +47.1	77.4	7 57.9 +47.1	77.4	14		
15	7 05.6 +42.2	75.9	7 20.2 +42.9	76.0	7 34.7 +43.6	76.1	7 49.0 +44.6	76.2	8 03.2 +45.1	76.4	8 17.3 +45.7	76.5	8 31.2 +46.4	76.7	8 45.0 +47.0	76.8	8 45.0 +47.0	76.8	8 45.0 +47.0	76.8	8 45.0 +47.0	76.8	15		
16	7 47.8 +42.2	75.1	8 03.1 +42.9	75.3	8 18.3 +43.6	75.4	8 33.4 +44.3	75.6	8 48.3 +44.9	75.7	9 03.0 +45.6	75.9	9 17.6 +46.3	76.0	9 32.0 +47.0	76.2	9 32.0 +47.0	76.2	9 32.0 +47.0	76.2	9 32.0 +47.0	76.2	16		
17	8 30.0 +42.1	74.4	8 46.0 +42.8	74.6	9 01.9 +43.5	74.7	9 17.7 +44.2	74.9	9 33.2 +44.9	75.0	9 48.6 +45.6	75.2	10 03.9 +46.2	75.4	10 19.0 +46.8	75.5	10 19.0 +46.8	75.5	10 19.0 +46.8	75.5	10 19.0 +46.8	75.5	17		
18	9 12.1 +41.9	73.7	9 28.8 +42.7	73.9	9 45.4 +44.3	74.0	10 01.9 +44.1	74.2	10 18.1 +44.8	74.4	10 34.2 +45.5	74.5	10 50.1 +46.2	74.7	11 05.8 +46.8	74.9	11 05.8 +46.8	74.9	11 05.8 +46.8	74.9	11 05.8 +46.8	74.9	18		
19	9 54.0 +41.9	73.0	10 11.5 +42.6	73.1	10 28.8 +43.4	73.3	10 46.0 +44.0	73.5	11 02.9 +44.7	73.7	11 19.7 +45.4	73.9	11 36.3 +46.0	74.1	11 52.6 +46.7	74.3	11 52.6 +46.7	74.3	11 52.6 +46.7	74.3	11 52.6 +46.7	74.3	19		
20	10 35.9 +41.8	72.2	10 54.1 +42.6	72.4	11 12.2 +43.2	72.6	11 30.0 +43.9	72.8	11 47.6 +44.7	73.0	12 05.1 +45.3	73.2	12 22.3 +46.0	73.4	12 39.3 +46.7	73.6	12 39.3 +46.7	73.6	12 39.3 +46.7	73.6	12 39.3 +46.7	73.6	20		
21	11 17.7 +41.7	71.5	11 36.7 +42.4	71.7	11 55.4 +43.1	71.9	12 13.9 +43.9	72.1	12 32.3 +44.5	72.3	12 50.4 +45.2	72.5	13 08.3 +45.8	72.8	13 26.0 +46.5	73.0	13 26.0 +46.5	73.0	13 26.0 +46.5	73.0	13 26.0 +46.5	73.0	21		
22	11 59.4 +41.6	70.8	12 19.1 +42.3	71.0	12 38.5 +43.0	71.2	12 57.8 +43.7	71.4	13 16.8 +44.8	71.6	13 35.6 +45.1	71.9	13 54.1 +45.8	72.1	14 12.5 +46.4	72.3	14 12.5 +46.4	72.3	14 12.5 +46.4	72.3	14 12.5 +46.4	72.3	22		
23	12 41.0 +41.4	70.0	13 01.4 +42.1	70.3	13 21.5 +42.9	70.5	13 41.5 +44.3	70.7	14 01.2 +44.3	70.9	14 20.7 +44.9	71.2	14 39.9 +45.6	71.4	14 58.9 +46.3	71.7	14 58.9 +46.3	71.7	14 58.9 +46.3	71.7	14 58.9 +46.3	71.7	23		
24	13 22.4 +41.4	69.3	13 43.5 +42.1	69.5	14 04.0 +44.2	69.8	14 25.1 +44.3	70.0	14 45.5 +44.1	70.2	15 05.6 +44.9	70.5	15 25.5 +45.6	70.7	15 45.2 +46.2	71.0	15 45.2 +46.2	71.0	15 45.2 +46.2	71.0	15 45.2 +46.2	71.0	24		
25	14 03.8 +41.1	68.6	14 25.6 +41.9	68.8	14 47.2 +42.6	69.0	15 08.5 +43.3	69.3	15 29.6 +44.0	69.5	15 50.6 +44.7	69.8	15 50.6 +44.7	69.8	16 11.1 +45.3	70.1	16 31.4 +46.0	70.3	16 31.4 +46.0	70.3	16 31.4 +46.0	70.3	25		
26	14 44.9 +41.1	67.8	15 07.5 +41.7	68.0	15 29.8 +42.5	68.3	15 51.8 +43.2	68.6	16 13.6 +43.9	68.8	16 35.2 +44.5	69.1	16 56.4 +45.3	69.4	17 17.4 +45.9	69.7	17 17.4 +45.9	69.7	17 17.4 +45.9	69.7	17 17.4 +45.9	69.7	26		
27	15 26.0 +40.8	67.0	15 49.2 +41.7	67.3	16 12.3 +42.3	67.6	16 35.0 +43.1	67.8	16 57.5 +43.8	68.1	17 19.7 +44.5	68.4	17 41.7 +45.1	68.7	18 03.3 +45.8	69.0	18 03.3 +45.8	69.0	18 03.3 +45.8	69.0	18 03.3 +45.8	69.0	27		
28	16 06.8 +40.8	66.3	16 30.9 +41.6	66.6	16 54.6 +42.2	66.8	17 18.1 +42.8	67.1	17 41.3 +43.5	67.4	18 04.2 +44.2	67.7	18 26.8 +44.9	68.0	18 49.1 +45.6	68.3	18 49.1 +45.6	68.3	18 49.1 +45.6	68.3	18 49.1 +45.6	68.3	28		
29	16 47.6 +40.5	65.5	17 12.3 +41.3	65.8	17 36.8 +42.0	66.1	18 00.9 +42.7	66.4	18 24.8 +43.4	66.7	19 09.7 +44.0	67.0	19 32.6 +44.3	67.3	20 09.9 +44.0	67.6	20 29.9 +44.7	67.9	20 29.9 +44.7	67.9	20 29.9 +44.7	67.9	20 29.9 +44.7	67.9	29
30	17 28.1 +40.4	64.7	17 53.6 +41.1	65.0	18 18.8 +41.8	65.3	18 43.6 +42.6	65.6	19 08.2 +43.3	66.0	19 32.5 +44.0	66.3	19 56.5 +44.7	66.6	20 20.2 +45.3	66.9	20 40.9 +45.3	67.0	20 40.9 +45.3	67.0	20 40.9 +45.3	67.0	30		
31	18 08.5 +40.2	64.0	18 34.7 +40.9	64.3	19 00.6 +41.6	64.6	19 26.2 +43.9	64.9	19 51.5 +43.0	65.2	20 16.5 +43.7	65.5	20 41.2 +44.4	65.9	21 05.5 +45.1	66.2	21 31.4 +45.8	66.5	21 31.4 +45.8	66.5	21 31.4 +45.8	66.5	31		
32	18 48.7 +39.9	63.2	19 15.6 +40.7	63.5	19 42.2 +41.4	63.8	20 08.4 +38.6	64.1	20 34.5 +42.9	64.4	21 00.2 +43.6	64.8	21 25.6 +44.3	65.2											

86°, 274° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180°Zn=Z
L.H.A. less than 180°Zn=360°-Z

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			Dec.
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	
0	2 49.6 +42.5	92.8	2 46.6 +43.2	92.9	2 43.6 +43.9	92.9	2 40.5 +44.6	93.0	2 37.4 +45.3	93.0	2 34.2 +46.0	93.1	2 31.0 +46.6	93.1	2 27.7 +47.3	93.2	0	2 27.7 +47.3	93.2	0	2 27.7 +47.3	93.2	0	0	
1	3 32.1 +42.4	92.1	3 29.8 +43.2	92.2	3 27.5 +43.9	92.2	3 25.1 +44.6	92.3	3 22.7 +45.3	92.4	3 20.2 +46.0	92.4	3 17.6 +46.7	92.5	3 15.0 +47.3	92.5	1	3 15.0 +47.3	92.5	1	3 15.0 +47.3	92.5	1	0	
2	4 14.5 +42.4	91.4	4 13.0 +43.1	91.5	4 11.4 +43.9	91.6	4 09.7 +44.6	91.6	4 08.0 +45.3	91.7	4 06.2 +45.9	91.8	4 04.3 +46.6	91.9	4 02.3 +47.3	91.9	2	4 02.3 +47.3	91.9	2	4 02.3 +47.3	91.9	2	0	
3	4 56.9 +42.4	90.7	4 56.1 +43.1	90.8	4 55.3 +43.8	90.9	4 54.3 +44.5	91.0	4 53.3 +45.2	91.0	4 52.1 +45.9	91.1	4 50.9 +46.6	91.2	4 49.6 +47.2	91.3	3	4 49.6 +47.2	91.3	3	4 49.6 +47.2	91.3	3	0	
4	5 39.3 +42.3	90.0	5 39.2 +43.1	90.1	5 39.1 +43.7	90.2	5 38.8 +44.5	90.3	5 38.5 +45.1	90.4	5 38.0 +45.5	90.5	5 37.5 +46.5	90.6	5 36.8 +47.2	90.7	4	5 36.8 +47.2	90.7	4	5 36.8 +47.2	90.7	4	0	
5	6 21.6 +42.2	89.3	6 22.3 +42.9	89.4	6 22.8 +43.8	89.5	6 23.3 +44.4	89.6	6 23.6 +45.2	89.7	6 23.9 +45.8	89.8	6 24.0 +46.5	90.0	6 24.0 +47.1	90.1	5	6 24.0 +47.1	90.1	5	6 24.0 +47.1	90.1	5	0	
6	7 03.8 +42.2	88.6	7 05.2 +43.0	88.7	7 06.6 +43.6	88.8	7 07.7 +44.4	88.9	7 08.8 +45.0	89.1	7 09.7 +45.7	89.2	7 10.5 +46.4	89.3	7 11.1 +47.1	89.4	6	7 11.1 +47.1	89.4	6	7 11.1 +47.1	89.4	6	0	
7	7 46.0 +42.1	87.8	7 48.2 +42.8	88.0	7 50.2 +43.8	88.1	7 52.1 +44.3	88.3	7 53.8 +45.0	88.4	7 55.4 +45.7	88.5	7 56.9 +46.4	88.7	7 58.2 +47.1	88.8	7	7 58.2 +47.1	88.8	7	7 58.2 +47.1	88.8	7	0	
8	8 28.1 +42.0	87.1	8 31.0 +42.8	87.3	8 33.8 +43.5	87.4	8 36.4 +44.2	87.6	8 38.8 +45.0	87.7	8 41.1 +45.7	87.9	8 43.3 +46.3	88.0	8 45.3 +46.9	88.2	8	8 45.3 +46.9	88.2	8	8 45.3 +46.9	88.2	8	0	
9	9 10.1 +41.9	86.4	9 13.8 +42.7	86.6	9 17.3 +43.4	86.7	9 20.6 +44.2	86.9	9 23.8 +44.8	87.1	9 26.8 +45.5	87.2	9 29.6 +46.2	87.4	9 32.2 +46.9	87.6	9	9 32.2 +46.9	87.6	9	9 32.2 +46.9	87.6	9	0	
10	9 52.0 +41.9	85.7	9 56.5 +42.5	85.9	10 00.7 +43.3	86.0	10 04.8 +44.0	86.2	10 08.6 +44.8	86.4	10 12.3 +45.5	86.6	10 15.8 +46.2	86.7	10 19.1 +46.9	86.9	10	19.1 +46.9	86.9	10	19.1 +46.9	86.9	10	0	
11	10 33.9 +41.7	85.0	10 39.0 +42.5	85.1	10 44.0 +43.3	85.3	10 48.8 +44.0	85.5	10 53.4 +44.7	85.7	10 57.8 +45.4	85.9	11 02.0 +46.1	86.1	11 06.0 +46.7	86.3	11	10 6.0 +46.7	86.3	11	10 6.0 +46.7	86.3	11	0	
12	11 15.6 +41.6	84.2	11 21.5 +42.4	84.4	11 27.3 +43.1	84.6	11 32.8 +43.9	84.8	11 38.1 +44.6	85.0	11 43.2 +45.3	85.2	11 48.1 +46.0	85.4	11 52.7 +46.7	85.6	12	11 52.7 +46.7	85.6	12	11 52.7 +46.7	85.6	12	0	
13	11 57.2 +41.6	83.5	12 03.9 +42.3	83.7	12 10.4 +43.0	83.9	12 16.7 +43.7	84.1	12 22.7 +44.5	84.3	12 28.5 +45.2	84.6	12 34.1 +45.9	84.8	12 39.4 +46.6	85.0	13	12 39.4 +46.6	85.0	13	12 39.4 +46.6	85.0	13	0	
14	12 38.8 +41.3	82.7	12 46.2 +42.2	83.0	12 53.4 +42.9	83.2	13 00.4 +43.7	83.4	13 07.2 +44.4	83.7	13 13.7 +45.1	83.9	13 20.0 +45.7	84.1	13 26.0 +46.5	84.4	14	13 26.0 +46.5	84.4	14	13 26.0 +46.5	84.4	14	0	
15	13 20.1 +41.3	82.0	13 28.4 +42.0	82.2	13 36.3 +42.8	82.5	13 44.1 +43.5	82.7	13 51.6 +44.2	83.0	13 58.8 +45.0	83.2	14 05.7 +45.7	83.5	14 12.5 +46.3	83.7	15	14 12.5 +46.3	83.7	15	14 12.5 +46.3	83.7	15	0	
16	14 01.4 +41.1	81.3	14 10.4 +41.9	81.5	14 19.1 +42.7	81.8	14 27.6 +43.4	82.0	14 35.8 +44.2	82.3	14 43.8 +44.8	82.5	14 51.4 +45.6	82.8	14 58.8 +46.3	83.1	15	14 58.8 +46.3	83.1	15	14 58.8 +46.3	83.1	15	0	
17	14 42.5 +41.0	80.5	14 52.3 +41.8	80.8	15 01.8 +42.5	81.0	15 11.0 +43.3	81.3	15 20.0 +44.0	81.6	15 28.6 +44.7	81.8	15 37.0 +45.4	82.1	15 45.1 +46.1	82.4	16	15 45.1 +46.1	82.4	16	15 45.1 +46.1	82.4	16	0	
18	15 23.5 +40.8	79.7	15 34.1 +41.6	80.0	15 44.3 +42.4	80.3	15 54.3 +43.1	80.6	16 04.0 +43.8	80.9	16 13.3 +44.6	81.1	16 22.4 +45.3	81.4	16 31.2 +46.0	81.7	17	16 31.2 +46.0	81.7	17	16 31.2 +46.0	81.7	17	0	
19	16 04.3 +40.7	79.0	16 15.7 +41.4	79.3	16 26.7 +42.2	79.6	16 37.4 +43.0	79.9	16 47.8 +43.7	80.1	16 57.9 +44.5	80.4	17 07.7 +45.2	80.7	17 17.2 +45.9	81.1	17	17 17.2 +45.9	81.1	17	17 17.2 +45.9	81.1	17	0	
20	16 45.0 +40.5	78.2	16 57.1 +41.3	78.5	17 08.9 +42.0	78.8	17 20.4 +42.8	79.1	17 31.5 +43.6	79.4	17 42.4 +44.3	79.7	17 52.9 +45.0	80.1	18 03.1 +45.7	80.4	18	18 03.1 +45.7	80.4	18	18 03.1 +45.7	80.4	18	0	
21	17 25.5 +40.3	77.4	17 38.4 +41.1	77.8	17 50.9 +41.9	78.1	18 03.2 +42.6	78.4	18 15.1 +43.4	78.7	18 26.7 +44.1	79.0	18 37.9 +44.9	79.4	18 48.8 +45.6	79.7	19	18 48.8 +45.6	79.7	19	18 48.8 +45.6	79.7	19	0	
22	18 05.8 +40.1	76.7	18 19.5 +40.9	77.0	18 32.8 +41.7	77.3	18 45.8 +42.5	77.6	18 58.5 +43.2	78.0	19 10.8 +44.0	78.3	19 22.8 +44.7	78.7	19 34.4 +45.4	79.0	20	19.8 +45.3	78.3	20	19.8 +45.3	78.3	20	0	
23	18 45.9 +39.9	75.9	19 00.4 +40.7	76.2	19 14.5 +41.5	76.6	19 28.3 +42.3	76.9	19 41.7 +43.0	77.2	19 54.8 +43.7	77.6	20 07.5 +44.5	78.0	20 19.8 +45.3	78.3	21	20 19.8 +45.3	78.3	21	20 19.8 +45.3	78.3	21	0	
24	19 25.8 +39.8	75.1	19 41.1 +40.5	75.4	19 56.0 +41.3	75.8	20 20.6 +42.0	76.1	20 24.7 +42.9	76.5	20 38.6 +43.4	76.9	20 52.0 +44.4	77.2	21 05.1 +45.1	77.6	22	21 05.1 +45.1	77.6	22	21 05.1 +45.1	77.6	22	0	
25	20 05.6 +39.5	74.3	20 21.6 +40.3	74.7	20 37.3 +41.1	75.0	20 52.6 +41.9	75.4	21 07.6 +42.7	75.8	21 22.2 +43.4	76.1	21 36.4 +44.1	76.5	21 50.2 +44.9	76.9	23	21 50.2 +44.9	76.9	23	21 50.2 +44.9	76.9	23	0	
26	20 45.1 +39.2	73.5	21 01.9 +40.1	73.9	21 18.4 +40.9	74.2	21 34.5 +41.7	74.6	21 50.3 +42.4	75.0	22 05.6 +43.2	75.4	22 20.5 +44.0	75.8	22 35.1 +44.7	76.2	24	22 35.1 +44.7	76.2	24	22 35.1 +44.7	76.2	24	0	
27	21 24.3 +39.1	72.7	21 42.0 +39.9	73.1	21 59.3 +40.6	73.4	22 16.2 +41.4	73.8	22 32.7 +42.2	74.2	22 48.8 +43.0	74.6	23 04.5 +43.7	75.0	23 19.8 +44.5	75.5	25	23 19.8 +44.5	75.5	25	23 19.8 +44.5	75.5	25	0	
28	22 03.4 +38.8	71.9	22 21.9 +39.6	72.3	22 39.9 +40.5	72.7	22 57.6 +41.2	73.1	23 14.9 +42.0	73.5	23 48.1 +42.7	73.9	23 31.8 +43.6	74.3	24 04.3 +44.2	74.7	26	24 04.3 +44.2	74.7	26	24 04.3 +44.2	74.7	26	0	
29	22 42.2 +38.5	71.0	23 01.5 +39.1	71.4	23 20.4 +39.8	71.8	23 38.8 +41.0	72.3	23 56.9 +41.8	72.7	24 14.6 +42.5	73.1	24 31.8 +43.3	73.5	24 48.5 +44.1	74.0	27	24 48.5 +44.1	74.0	27	24 48.5 +44.1	74.0	27	0	
30	23 20.7 +38.3	70.2	23 40.8 +39.1	70.6	24 00.5 +39.9	71.0	24 19.8 +40.7	71.5	24 38.7 +41.5	71.9	24 57.1 +42.3	72.3	25 15.1 +43.1	72.8	25 32.6 +43.9	73.2	30	25 32.6 +43.9	73.2	30	25 32.6 +43.9	73.2	30	0	
31	23 59.0 +38.0	69.4	24 19.9 +38.8	69.8	24 40.4 +39.7	70.2	25 00.5 +40.5	70.7	25 20.2 +41.2	71.1	25 39.4 +42.0	71.6	25 58.2 +42.8	72.0	26 16.5 +43.5	72.5	31	26 16.5 +43.5	72.5	31	26 16.5 +43.5	72.5	31	0	
32	24 37.0 +37.7	68.5	24 58.7 +38.6	69.0	25 20.1 +39.3	69.4	25 41.0 +40.1	69.8	26 01.4 +41.0	70.3	26 21.4 +41.8	70.8	26 41.0 +42.5	71.2	27 00.0 +43.4	71.7	32	27 00.0 +43.4	71.7	32	27 00.0 +43.4	71.7	32	0	
33																									

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 86°, 274°

Dec.	45°			46°			47°			48°			49°			50°			51°			Dec.							
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z								
0	2	49.6	-42.5	92.8	2	46.6	-43.2	92.9	2	43.6	-43.9	92.9	2	40.5	-44.6	93.0	2	37.4	-45.4	93.0	2	34.2	-46.0	93.1	2	27.7	-47.3	93.2	0
1	2	07.1	-42.5	93.5	2	03.4	-43.2	93.6	1	59.7	-44.0	93.6	1	55.9	-44.7	93.6	1	52.0	-45.3	93.7	1	48.2	-46.1	93.7	1	44.3	-46.7	93.7	1
2	1	24.6	-42.5	94.2	1	20.2	-43.3	94.3	1	15.7	-44.0	94.3	1	11.2	-44.7	94.3	1	06.7	-45.4	94.3	1	02.1	-46.0	94.4	0	57.6	-46.7	94.4	2
3	0	42.1	-42.5	94.9	0	36.9	-43.2	95.0	0	31.7	-43.9	95.0	0	26.5	-44.6	95.0	0	21.3	-45.3	95.0	0	16.1	-46.0	95.0	0	05.7	-47.4	95.0	3
4	0	00.4	+42.5	84.3	0	06.3	+43.3	84.3	0	12.2	+44.0	84.3	0	18.1	+44.7	84.4	0	29.9	+45.1	84.4	0	35.8	+46.7	84.4	0	41.7	+47.3	84.4	4
5	0	42.9	+42.6	83.6	0	49.6	+43.2	83.7	0	56.2	+44.0	83.7	1	02.8	+44.7	83.7	1	09.4	+45.4	83.7	1	16.0	+46.0	83.7	1	22.5	+46.7	83.7	5
6	1	25.5	+42.5	82.9	1	32.8	+43.3	83.0	1	40.2	+43.9	83.0	1	47.5	+44.6	83.0	1	54.8	+45.3	83.1	2	02.0	+46.0	83.1	2	09.2	+46.7	83.1	6
7	2	08.0	+42.5	82.2	2	16.1	+43.2	82.3	2	24.1	+43.9	82.3	2	32.1	+44.7	82.3	2	40.1	+45.3	82.4	2	48.0	+46.0	82.4	2	55.9	+46.6	82.5	7
8	2	50.5	+42.4	81.5	2	59.3	+43.2	81.6	3	08.0	+44.0	81.6	3	16.8	+44.6	81.7	3	25.4	+45.3	81.7	3	34.0	+46.0	81.8	3	42.5	+46.7	81.9	8
9	3	32.9	+42.5	80.8	3	42.5	+43.1	80.9	3	52.0	+43.8	80.9	4	01.4	+44.5	81.0	4	10.7	+45.3	81.1	4	20.0	+45.9	81.2	4	29.2	+46.5	81.2	9
10	4	15.4	+42.3	80.1	4	25.6	+43.1	80.2	4	35.8	+43.9	80.3	4	45.9	+44.6	80.3	4	56.0	+45.2	80.4	5	05.9	+45.9	80.5	5	15.7	+46.6	80.6	10
11	4	57.7	+42.4	79.4	5	08.7	+43.1	79.5	5	19.7	+43.7	79.6	5	30.5	+44.4	79.7	5	41.2	+45.2	79.8	5	51.8	+45.8	79.9	6	02.3	+46.5	80.0	11
12	5	40.0	+42.3	78.7	5	51.8	+43.2	78.8	6	03.4	+43.8	78.9	6	14.9	+44.5	79.0	6	26.6	+45.7	79.1	6	37.6	+45.8	79.2	6	48.8	+46.5	79.3	12
13	6	22.4	+42.2	78.0	6	34.8	+43.0	78.1	6	47.2	+43.6	78.2	6	59.4	+44.4	78.3	7	11.5	+45.0	78.4	7	23.4	+45.8	78.6	7	35.3	+46.4	78.7	13
14	7	04.6	+42.2	77.3	7	17.8	+42.9	77.4	7	30.8	+43.7	77.5	7	43.8	+44.3	77.6	7	56.5	+45.0	77.8	8	09.2	+45.7	77.9	8	21.7	+46.3	78.1	14
15	7	46.8	+42.1	76.5	8	00.7	+42.8	76.7	8	14.5	+43.5	76.8	8	28.1	+44.2	77.0	8	41.5	+45.0	77.1	8	54.9	+45.6	77.3	9	21.0	+46.9	77.6	15
16	8	28.9	+42.0	75.8	8	43.5	+42.8	76.0	8	58.0	+43.5	76.1	9	12.3	+44.2	76.3	9	26.5	+44.8	76.4	9	40.5	+45.5	76.6	10	07.9	+46.9	76.9	16
17	9	10.9	+41.9	75.1	9	26.3	+42.6	75.3	9	41.5	+43.3	75.4	9	56.5	+44.1	75.6	10	11.3	+44.8	75.8	10	26.0	+45.4	75.9	10	40.5	+46.1	76.1	17
18	9	52.8	+41.9	74.4	10	08.9	+42.6	74.5	10	24.8	+43.3	74.7	10	40.6	+43.9	74.9	10	56.1	+44.7	75.1	11	11.4	+45.4	75.3	11	26.6	+46.0	75.5	18
19	10	34.7	+41.7	73.6	10	51.5	+42.5	73.8	11	08.1	+43.2	74.0	11	24.5	+43.9	74.2	11	40.8	+44.6	74.4	11	56.8	+45.3	74.6	12	28.3	+46.6	75.0	19
20	11	16.4	+41.6	72.9	11	34.0	+42.3	73.1	11	51.3	+43.1	73.3	12	08.4	+43.8	73.5	12	25.4	+45.4	73.7	12	42.1	+45.1	73.9	12	58.6	+45.8	74.1	20
21	11	58.0	+41.6	72.2	12	16.3	+42.3	72.4	12	34.4	+42.9	72.6	12	52.2	+43.7	72.8	13	09.8	+44.4	73.0	13	27.2	+45.1	73.3	13	44.4	+45.7	73.5	21
22	12	39.6	+41.3	71.4	12	58.6	+42.1	71.7	13	17.3	+42.9	71.9	13	35.9	+43.5	72.1	13	54.2	+44.3	72.3	14	12.3	+44.9	72.6	14	30.1	+45.7	72.8	22
23	13	20.9	+41.3	70.7	13	40.7	+42.0	70.9	14	00.2	+42.7	71.2	14	19.4	+43.5	71.4	14	38.5	+44.1	71.6	14	57.2	+44.9	71.9	15	15.8	+45.5	72.1	23
24	14	02.2	+41.1	69.9	14	22.7	+41.8	70.2	14	42.9	+42.6	70.4	15	02.9	+43.3	70.7	15	22.6	+44.0	70.9	15	42.1	+44.6	71.2	16	01.3	+45.3	71.5	24
25	14	43.3	+41.0	69.2	15	04.5	+41.7	69.4	15	25.5	+42.4	69.5	15	46.2	+43.1	70.0	16	06.6	+43.8	70.2	16	26.7	+44.6	70.5	16	46.6	+45.3	70.8	25
26	15	24.3	+40.8	68.4	15	46.2	+41.6	68.7	16	07.9	+42.3	69.0	16	29.3	+43.0	69.2	16	50.4	+43.7	69.5	17	11.3	+44.4	69.8	17	31.9	+45.0	70.4	26
27	16	05.1	+40.7	67.7	16	27.8	+41.4	67.9	16	50.2	+42.1	68.2	17	12.3	+42.8	68.5	17	34.1	+43.6	68.8	17	55.7	+44.2	69.1	18	16.9	+45.0	69.4	18
28	16	45.8	+40.5	66.9	17	09.2	+41.2	67.2	17	32.3	+42.0	67.5	17	55.1	+42.7	67.8	18	17.7	+43.4	68.1	18	39.9	+44.1	68.4	19	01.9	+44.8	68.7	19
29	17	26.3	+40.3	66.1	17	50.4	+41.1	66.4	18	14.3	+41.7	66.7	19	37.8	+42.5	67.0	19	01.1	+43.2	67.3	19	46.7	+44.6	68.0	20	09.0	+45.3	68.3	29
30	18	06.6	+40.1	65.4	18	31.5	+40.8	65.7	18	56.0	+41.6	66.0	19	20.3	+42.3	66.3	19	44.3	+43.0	66.6	20	07.9	+43.8	66.9	20	31.3	+44.4	67.3	30
31	18	46.7	+39.9	64.6	19	12.3	+40.7	64.9	19	37.6	+41.4	65.2	20	02.6	+42.6	65.5	20	27.3	+42.9	65.9	20	51.7	+43.5	66.2	21	39.4	+44.9	66.9	31
32	19	26.6	+39.7	63.8	19	53.0	+40.4	64.1	20	19.0	+41.2	64.4	20	44.8	+41.9	64.8	21	10.2	+42.6	65.1	22	00.0	+44.0	65.5	22	00.0	+44.8	66.2	32
33	20	06.3	+39.5	63.0	20	33.4	+40.3	63.3	21	00.2	+41.0	63.7	21	26.7	+41.7	64.0	21	52.8	+42.4	64.4	22	18.6	+43.1	64.7	22	44.0	+43.9	65.5	33
34	20	45.8	+39.3	62.2	21	13.7	+40.0	62.5	21	41.2	+40.7	62.9	22	28.4	+41.5	63.2	22	35.2	+42.2	63.6	23	01.7	+43.0	64.0	23	27.9	+43.6	64.4	34
35	21	25.1	+39.0	61.4	21	53.7	+39.8	61.7	22	21.9	+40.6	62.1	22	49.9	+41.2	62.5	23	17.4	+42.0	62.8	23	44.7	+42.7	63.2	24	11.5	+43.4	63.6	35
36	22	04.1	+38.8	60.6	23	32.5	+39.5	60.9	23	02.5	+40.2	61.3	23	31.1	+41.0	61.7	23	59.4	+38.4	62.0	24	27.4	+42.4	62.4	24	54.9	+43.2	62.9	36
37	22	42.9	+38.6	59.7	23	13.0	+39.3	60.1	23	42.7	+40.1	60.5	24	12.1	+40.8	60.9	24	41.2	+41.5	61.3	25	38.1	+42.9	62.1	26	06.0	+43.6	62.5	37
38	23	21.5	+38.2	58.9	23	52.3	+39.0	59.3	24	22.8	+39.7	59.7	24	52.9	+40.5	60.1	25	22.7	+41.2	60.5	25	52.0	+42.0	60.9	26	21.0</td			

87°, 273° L.H.A.

LATITUDE SAME NAME AS DECLINATION

{ L.H.A. greater than 180°Zn=Z
N. Lat. { L.H.A. less than 180°Zn=360°-Z }

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			Dec.											
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z												
0	2 07.3 +42.4	92.1	2 05.0 +43.2	92.2	2 02.7 +43.9	92.2	2 00.4 +44.6	92.2	1 58.1 +45.3	92.3	1 55.7 +46.0	92.3	1 53.2 +46.7	92.3	1 50.8 +47.3	92.4	0	2 49.7 +42.4	91.4	2 48.2 +43.1	91.5	2 46.6 +43.9	91.5	2 45.0 +44.6	91.6	2 43.4 +45.2	91.6	2 41.7 +45.9	91.7	2 39.9 +46.6	91.7	2 38.1 +47.3	91.7	1		
1	2 49.7 +42.4	91.4	2 48.2 +43.1	91.5	2 46.6 +43.9	91.5	2 45.0 +44.6	91.6	2 43.4 +45.2	91.6	2 41.7 +45.9	91.7	2 39.9 +46.6	91.7	2 38.1 +47.3	91.7	1	3 32.1 +42.4	90.7	3 31.3 +43.2	90.8	3 30.5 +43.9	90.8	3 29.6 +44.6	90.9	3 28.6 +45.3	91.0	3 27.6 +45.9	91.0	3 26.5 +46.6	91.1	3 25.4 +47.2	91.1	2		
2	4 14.5 +42.3	90.0	4 14.5 +43.0	90.1	4 14.4 +43.8	90.1	4 14.2 +44.5	90.2	4 13.9 +45.2	90.3	4 13.5 +45.9	90.4	4 13.1 +46.6	90.4	4 12.6 +47.2	90.5	3	4 56.8 +42.3	89.3	4 57.5 +43.1	89.4	4 58.2 +43.7	89.5	4 58.7 +44.5	89.5	4 59.4 +45.2	89.6	4 59.7 +45.9	89.7	4 59.8 +47.2	89.9	4				
3	5 39.1 +42.3	88.6	5 40.6 +43.0	88.7	5 41.9 +43.7	88.8	5 43.2 +44.4	88.9	5 44.3 +45.1	89.0	5 45.3 +45.8	89.1	5 46.2 +46.5	89.2	5 47.0 +47.2	89.3	5	6 21.4 +42.2	87.9	6 23.6 +42.9	88.0	6 25.6 +43.7	88.1	6 27.6 +44.4	88.2	6 29.4 +45.1	88.3	6 31.1 +45.8	88.4	6 32.7 +46.5	88.5	6 34.2 +47.1	88.7	6		
4	7 03.6 +42.1	87.1	7 06.5 +42.9	87.3	7 09.3 +43.6	87.4	7 12.0 +44.3	87.5	7 14.5 +45.0	87.6	7 16.9 +45.7	87.8	7 19.2 +46.4	87.9	7 21.3 +47.0	88.0	7	7 45.7 +42.1	86.4	7 49.4 +42.8	86.6	7 52.9 +43.5	86.7	7 56.3 +44.2	86.8	7 59.5 +45.0	87.0	8 02.6 +45.7	87.1	8 05.6 +46.3	87.3	8 08.3 +47.0	87.4	8		
5	8 27.8 +41.9	85.7	8 32.2 +42.7	85.9	8 36.4 +43.5	86.0	8 40.5 +44.2	86.2	8 44.5 +44.9	86.3	8 48.3 +45.5	86.5	8 51.9 +46.3	86.6	8 55.3 +47.0	86.8	9	9 09.7 +41.9	85.0	9 14.9 +42.6	85.1	9 19.9 +43.4	85.3	9 24.7 +44.1	85.5	9 29.4 +44.8	85.6	9 33.8 +45.6	85.8	9 38.2 +46.1	86.0	9 42.3 +46.8	86.1	10		
10	9 51.6 +41.8	84.3	9 57.5 +42.6	84.4	10 03.3 +43.3	84.6	10 08.8 +44.0	84.8	10 14.2 +44.7	85.0	10 19.4 +45.4	85.1	10 24.3 +46.2	85.3	10 29.1 +46.8	85.5	11	11 15.1 +41.6	82.8	11 22.5 +42.4	83.0	11 29.8 +43.0	83.2	11 36.8 +43.8	83.4	11 43.5 +44.6	83.6	11 50.1 +45.3	83.8	11 56.5 +45.9	84.0	12 02.6 +46.6	84.2	13		
11	11 56.7 +41.5	82.1	12 04.9 +42.2	82.3	12 12.8 +43.0	82.5	12 20.6 +43.7	82.7	12 28.1 +44.4	82.9	12 35.4 +45.1	83.1	12 42.4 +45.9	83.4	12 49.2 +46.6	83.6	14	12 38.2 +41.3	81.3	12 47.1 +42.1	81.5	12 55.8 +42.9	82.0	13 12.5 +44.3	82.5	13 20.5 +45.1	82.7	13 28.3 +45.7	82.7	13 35.8 +46.4	82.9	15				
12	13 19.5 +41.2	80.6	13 29.2 +42.0	80.8	13 38.7 +42.7	81.0	13 47.9 +43.5	81.3	13 56.8 +44.3	81.5	14 05.6 +44.9	81.8	14 14.0 +45.6	82.0	14 22.2 +46.3	82.3	16	14 00.7 +41.1	79.8	14 11.2 +41.8	80.1	14 21.4 +42.6	80.3	14 41.1 +44.0	80.8	14 50.5 +44.8	81.1	14 59.6 +45.5	81.4	15 08.5 +46.2	81.6	17				
13	14 41.8 +40.9	79.1	14 53.0 +41.7	79.3	15 04.0 +42.5	79.6	15 14.7 +43.2	79.9	15 25.1 +44.0	80.1	15 35.3 +44.6	80.4	15 45.1 +45.4	80.7	15 54.7 +46.1	81.0	18	15 22.7 +40.8	78.3	15 34.7 +41.6	78.6	15 46.5 +42.3	78.9	15 57.9 +43.1	79.1	16 09.1 +43.8	79.4	16 19.9 +44.6	79.7	16 30.5 +45.2	80.0	16 40.8 +45.9	80.3	19		
14	16 03.5 +40.6	77.6	16 16.3 +41.4	77.8	16 28.4 +42.1	78.1	16 41.0 +42.9	78.4	16 52.9 +43.6	78.7	17 04.5 +44.4	79.0	17 15.7 +45.2	79.3	17 26.7 +45.8	79.6	20	16 38.2 +41.3	76.8	16 47.1 +42.1	77.1	17 10.9 +42.0	77.4	17 23.9 +42.8	77.7	17 36.5 +43.5	78.0	17 48.9 +44.2	78.3	18 00.9 +44.9	78.6	18 12.5 +45.7	78.9	21		
15	17 24.6 +40.2	76.0	17 38.9 +41.1	76.3	17 52.9 +41.9	76.6	18 06.7 +42.5	77.0	18 20.0 +43.4	77.3	18 33.1 +44.1	77.6	18 45.8 +44.8	77.9	18 58.2 +45.5	78.3	22	17 04.0 +41.1	75.8	17 14.2 +41.8	76.1	17 24.4 +42.6	76.3	17 34.9 +43.3	76.7	17 44.7 +43.9	77.0	17 54.3 +45.3	77.6	19 43.7 +45.3	77.7	23				
16	18 04.8 +40.1	75.2	18 20.0 +40.8	75.6	18 34.8 +41.6	75.9	18 49.2 +42.4	76.2	19 03.4 +43.1	76.5	19 17.2 +43.2	76.9	19 26.0 +44.6	77.2	19 36.6 +44.6	77.6	20	18 44.9 +39.9	74.5	19 08.0 +40.7	74.8	19 16.4 +41.4	75.1	19 31.6 +42.6	75.5	19 46.5 +43.0	75.8	20 01.1 +43.7	76.2	20 15.2 +44.5	76.5	20 29.0 +45.2	76.9	24		
17	19 24.8 +39.7	73.7	19 41.5 +40.5	74.0	19 57.8 +41.3	74.4	20 13.9 +42.0	74.7	20 29.5 +42.8	75.1	20 44.8 +43.5	75.4	20 59.7 +44.3	75.8	21 14.2 +45.0	76.2	25	19 41.5 +39.7	72.9	20 22.0 +40.2	73.2	20 39.1 +41.0	73.6	20 55.9 +41.8	73.9	21 12.3 +42.6	74.3	21 28.3 +43.4	74.7	21 44.0 +44.1	75.1	21 59.2 +44.9	75.5	26		
18	20 04.5 +39.4	72.9	20 22.0 +40.2	73.2	20 39.1 +41.0	73.6	20 55.9 +41.8	73.9	21 12.3 +42.6	74.3	21 28.3 +43.4	74.7	21 44.0 +44.1	75.1	21 59.2 +44.9	75.5	27	20 43.9 +39.2	72.1	21 02.2 +40.0	72.4	21 20.1 +40.9	72.8	21 37.7 +41.6	73.2	21 54.9 +42.4	73.6	22 11.7 +43.1	73.9	22 28.1 +43.9	74.3	22 44.1 +44.6	74.7	27		
19	21 23.1 +39.0	71.3	21 42.2 +39.8	71.6	22 01.0 +40.5	72.0	22 19.3 +41.4	72.4	22 37.3 +42.1	72.8	22 54.8 +42.9	73.2	23 12.0 +43.6	73.6	23 20.5 +43.6	73.6	23 28.7 +44.4	74.0	24	21 22.7 +38.8	70.4	22 22.0 +39.6	70.8	22 41.5 +40.4	71.2	23 00.7 +41.1	71.6	23 19.4 +41.9	72.0	23 37.7 +42.7	72.4	23 55.6 +43.7	72.9	24 13.1 +44.2	73.3	29
20	22 40.9 +38.5	69.6	23 01.6 +39.3	70.0	23 21.9 +40.1	70.4	23 41.8 +40.9	70.8	24 01.3 +41.7	71.2	24 20.4 +42.5	71.7	24 39.1 +43.2	72.1	24 57.3 +44.0	72.5	27	22 48.3 +37.0	69.6	23 08.0 +39.3	70.0	23 28.6 +40.7	70.6	24 05.7 +40.9	71.2	24 30.2 +41.7	71.3	25 41.3 +43.7	71.8	25 41.7 +44.0	72.5	30				
31	23 19.4 +38.2	68.8	23 40.9 +39.0	69.2	24 02.0 +39.9	69.6	24 22.7 +40.7	70.0	24 43.0 +41.4	70.4	25 02.9 +42.2	70.9	25 22.3 +43.0	71.3	25 41.3 +43.7	71.8	31	23 57.6 +37.9	67.9	24 19.9 +38.8	68.3	24 41.9 +39.5	68.8	25 03.4 +40.3	69.2	25 45.1 +42.0	69.6	26 05.3 +42.7	70.6	26 25.0 +43.5	71.0	31				
32	24 35.5 +37.7	67.1	24 58.7 +38.5	67.5	25 21.4 +39.3	67.9	25 43.7 +40.1	68.4	26 05.6 +40.9	68.8	26 27.1 +41.6	69.3	26 51.1 +42.5	69.8	27 08.5 +43.3	70.2	33	24 35.7 +37.7	67.1	24 58.3 +38.5	67.5	25 12.5 +39.3	67.9	25 43.7 +40.1	68.4	26 14.7 +40.9	69.5	27 08.5 +43.3	70.2	33						
33	25 13.5 +37.7	66.7	25 37.2 +38.1	66.7	26 00.7 +39.0	67.1	26 23.8 +39.9	67.6	26 46.5 +40.6	68.0	27 08.7 +41.5	68.5	27 30.5 +42.2	69.0	27 33.8 +42.6	69.5	28	25 24.5 +37.7	65.9	25 47.4 +38.4	66.3	26 12.5 +39.3	67.1	26 32.1 +38.7	67.7	26 59.4 +41.3	68.5	29 12.1 +40.5	69.0	29 36.2 +41.3	69.6	30 59.9 +42.1	67.1	37		
34	25 34.5 +37.7	65.4	26 15.3 +37.9	65.8	26 39.7 +38.7	66.3	27 03.7 +39.5	66.7	27 27.1 +40.4	67.2	27 50.2 +41.1	67.7	28 12.7 +41.9	68.2	28 34.8 +42.7	68.7	35	25 26.7 +37.7	65.4	26 39.7 +38.7	66.3	27 03.7 +39.5	66.0	27 22.1 +38.7	66.2	27 51.2 +40.3	67.4	27 55.7 +40.3	67.5	28 08.5 +43.3	68.0	32				
35	25 50.5 +37.1	65.4	26 15.3 +37.9	65.8	26 39.7 +38.7	66.3	27 03.7 +39.5	66.7	27 27.1 +40.4	67.2	27 50.2 +41.1	67.7	28 12.7 +41.9	68.2	28 34.8 +42.7	68.7	35	25 26.7 +37.1	65.4	26 39.7 +38.7	66.3	27 03.7 +39.5	66.0	27 22.1 +38.7	66.2	27 51.2 +40.3	67.4	27 55.7 +40.3	67.5	28 08.5 +43.3	68.0	34				
36	26 27.6 +36.7	64.5	26 53.2 +37.6	64.9	27 18.4 +38.4	65.4	27 43.2 +39.2	65.9	28 07.5 +40.0	66.4	28 31.3 +40.6	67.4	28 54.6 +41.6	67.4	29 17.5 +42.4	67.9	36	26 28.6 +36.7	64.5	27 18.4 +38.4	65.0	27 43.2 +39.2	65.6	28 05.6 +40.3	66.0	28 3										

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 87°, 273°

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			Dec.								
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z									
0	2	07.3	-42.5	92.1	2	05.0	-43.2	92.2	2	02.7	-43.9	92.2	2	00.4	-44.6	92.2	1	58.1	-45.4	92.3	1	55.7	-46.0	92.3	1	53.2	-46.6	92.3	1	50.8	-47.3	92.4	0
1	1	24.8	-42.5	92.8	1	21.8	-43.2	92.9	1	18.8	-43.9	92.9	1	15.8	-44.6	92.9	1	12.7	-45.3	92.9	1	09.7	-46.0	92.9	1	06.6	-46.7	93.0	1	03.5	-47.3	93.0	1
2	0	42.3	-42.5	93.5	0	38.6	-43.2	93.5	0	34.9	-43.9	93.6	0	31.2	-44.7	93.6	0	27.4	-45.3	93.6	0	23.7	-46.0	93.6	0	19.9	-46.7	93.6	0	16.2	-47.4	93.6	2
3	0	00.2	+42.5	85.8	0	04.6	+43.2	85.8	0	09.0	+44.0	85.8	0	13.5	+44.6	85.8	0	17.9	+45.3	85.8	0	22.3	+46.0	85.8	0	26.8	+46.6	85.8	0	31.2	+47.3	85.8	3
4	0	42.7	+42.4	85.1	0	47.8	+43.2	85.1	0	53.0	+43.9	85.1	0	58.1	+44.6	85.1	1	03.2	+45.3	85.1	1	08.3	+46.0	85.1	1	13.4	+46.7	85.2	1	18.5	+47.3	85.2	4
5	1	25.1	+42.5	84.3	1	31.0	+43.2	84.4	1	36.9	+43.9	84.4	1	42.7	+44.7	84.4	1	48.6	+45.3	84.5	1	54.3	+46.0	84.5	2	00.1	+46.6	84.5	2	05.8	+47.3	84.6	5
6	2	07.6	+42.4	83.6	2	14.2	+43.2	83.7	2	20.8	+43.9	83.7	2	27.4	+44.6	83.8	2	33.9	+45.2	83.8	2	40.3	+46.0	83.8	2	46.7	+46.6	83.9	2	53.1	+47.2	83.9	6
7	2	50.0	+42.5	82.9	2	57.4	+43.1	83.0	3	04.7	+43.9	83.0	3	12.0	+44.5	83.1	3	19.1	+45.3	83.1	3	26.3	+45.9	83.2	3	33.3	+46.6	83.3	3	40.3	+47.3	83.3	7
8	3	32.5	+42.3	82.2	3	40.5	+43.2	82.3	3	48.6	+43.8	82.4	3	56.5	+44.6	82.4	4	04.4	+45.2	82.5	4	12.2	+45.9	82.6	4	19.9	+46.6	82.6	4	27.6	+47.2	82.7	8
9	4	14.8	+42.4	81.5	4	23.7	+43.0	81.6	4	32.4	+43.8	81.7	4	41.1	+44.5	81.7	4	49.6	+45.2	81.8	4	58.1	+45.9	81.9	5	06.5	+46.5	82.0	5	14.8	+47.2	82.1	9
10	4	57.2	+42.3	80.8	5	06.7	+43.1	80.9	5	16.2	+43.7	81.0	5	25.6	+44.4	81.1	5	34.8	+45.2	81.2	5	44.0	+45.8	81.3	5	53.0	+46.5	81.4	6	02.0	+47.1	81.5	10
11	5	39.5	+42.2	80.1	5	49.8	+43.0	80.2	5	59.5	+43.7	80.3	6	10.0	+44.4	80.4	6	20.0	+45.1	80.5	6	29.8	+45.8	80.6	6	39.5	+46.5	80.7	6	49.1	+47.1	80.8	11
12	6	21.7	+42.2	79.4	6	32.8	+42.9	79.5	6	43.6	+43.7	79.6	6	54.4	+44.0	79.7	7	05.1	+45.7	79.8	7	15.6	+45.7	80.0	7	26.0	+46.3	80.1	7	36.2	+47.1	80.2	12
13	7	03.9	+42.2	78.7	7	15.7	+42.8	78.8	7	27.3	+43.5	78.9	7	38.7	+44.3	79.0	7	50.1	+45.0	79.2	8	01.3	+45.6	79.3	8	12.3	+46.4	79.5	8	23.3	+46.9	79.6	13
14	7	46.1	+42.0	77.9	7	58.5	+42.8	78.1	8	10.8	+43.6	78.2	8	23.0	+44.2	78.4	8	35.1	+44.9	78.5	8	46.9	+45.6	78.7	8	58.7	+46.2	78.8	9	10.2	+46.9	79.0	14
15	8	28.1	+42.0	77.2	8	41.3	+42.7	77.4	8	54.4	+43.4	77.5	9	07.2	+44.2	77.7	9	20.0	+44.8	77.8	9	32.5	+45.5	78.0	9	44.9	+46.2	78.2	9	57.1	+46.9	78.3	15
16	9	10.1	+41.9	76.5	9	24.0	+42.6	76.7	9	37.8	+43.3	76.8	10	4.4	+44.0	77.0	10	18.0	+45.5	77.2	10	31.1	+46.1	77.5	10	44.0	+46.7	77.7	16				
17	9	52.0	+41.8	75.8	10	06.6	+42.6	75.9	10	21.1	+43.3	76.1	10	35.4	+44.0	76.3	10	49.5	+44.7	76.5	11	03.5	+45.3	76.7	11	17.2	+46.0	76.9	11	30.7	+46.7	77.1	17
18	10	33.8	+41.7	75.0	10	49.2	+42.4	75.2	11	04.4	+43.1	75.4	11	19.4	+43.8	75.6	11	34.2	+44.6	75.8	12	03.2	+45.9	76.0	12	03.2	+45.9	76.2	12	17.4	+46.6	76.4	18
19	11	15.5	+41.5	74.3	11	31.6	+42.3	74.5	11	47.5	+43.1	74.7	12	03.2	+43.8	74.9	12	18.8	+44.4	75.1	12	49.1	+45.9	75.5	13	04.0	+46.5	75.8	19				
20	11	57.0	+41.5	73.6	12	13.9	+42.2	73.8	12	30.6	+42.9	74.0	12	47.0	+43.6	74.2	13	03.2	+44.4	74.4	13	19.2	+45.0	74.7	13	35.0	+45.7	74.9	13	50.5	+46.4	75.1	20
21	12	38.5	+41.4	72.8	12	56.1	+42.1	73.1	13	13.5	+42.8	73.3	13	30.6	+43.6	73.5	13	47.6	+44.2	73.7	14	04.2	+45.0	74.0	14	20.7	+45.6	74.2	14	36.9	+46.3	74.5	21
22	13	19.9	+41.2	72.1	13	38.2	+41.9	72.3	13	56.3	+42.7	72.6	14	14.2	+43.4	72.8	14	31.8	+44.1	73.0	14	49.2	+44.8	73.3	15	06.3	+45.5	73.5	15	23.2	+46.1	73.8	22
23	14	01.1	+41.0	71.3	14	20.1	+41.9	71.6	14	39.0	+42.5	71.8	14	57.6	+43.2	72.1	15	15.9	+44.0	72.3	15	34.0	+44.6	72.6	15	51.8	+45.3	72.9	16	09.3	+46.0	73.1	23
24	14	42.1	+41.0	70.6	15	02.0	+41.6	70.8	15	21.5	+42.4	71.1	15	40.8	+43.2	71.4	15	59.9	+43.8	71.6	16	18.6	+44.6	71.9	16	37.1	+45.3	72.2	16	55.3	+46.0	72.5	24
25	15	23.1	+40.7	69.8	15	43.6	+41.5	70.1	16	03.9	+42.3	70.4	16	24.0	+42.9	70.6	16	43.7	+43.7	70.9	17	03.2	+44.4	71.2	17	22.4	+45.0	71.5	17	41.3	+45.7	71.8	25
26	16	03.8	+40.7	69.1	16	25.1	+41.4	69.3	16	46.2	+42.1	69.6	17	06.9	+42.8	69.9	17	27.4	+43.5	70.2	17	47.6	+44.2	70.5	18	07.4	+45.0	70.8	18	27.0	+45.6	71.1	26
27	16	44.5	+40.4	68.3	17	06.5	+41.2	68.6	17	28.3	+43.1	68.9	17	49.7	+42.7	69.2	18	10.9	+43.4	69.5	18	31.8	+44.1	69.8	18	52.4	+44.8	70.1	19	12.6	+45.5	70.4	27
28	17	24.9	+40.3	67.5	17	47.7	+41.0	67.8	18	10.2	+41.7	68.1	18	32.4	+42.5	68.4	18	54.3	+43.2	68.8	19	15.9	+43.9	69.1	19	37.2	+44.6	69.4	19	58.1	+45.3	69.7	28
29	18	05.2	+40.0	66.8	18	28.7	+40.8	67.1	18	51.9	+41.6	67.4	19	14.9	+42.3	67.7	19	37.5	+43.0	68.0	20	21.8	+44.4	68.3	20	21.8	+44.4	68.7	20	43.4	+45.1	69.0	29
30	18	45.2	+39.9	66.0	19	09.5	+40.6	66.3	19	33.5	+41.4	66.6	19	57.2	+42.1	66.9	20	20.5	+42.8	67.3	20	43.5	+43.6	67.6	21	06.2	+44.2	68.0	21	28.5	+45.0	68.3	30
31	19	25.1	+39.7	65.2	19	50.1	+40.5	65.5	20	14.9	+41.6	65.8	20	39.3	+41.9	66.2	21	03.3	+42.7	66.5	21	27.1	+43.3	66.9	21	50.4	+44.1	67.2	22	13.5	+44.7	67.6	31
32	20	04.8	+39.4	64.4	20	30.6	+40.2	64.7	20	56.0	+41.0	65.1	21	21.2	+41.7	65.4	21	46.0	+42.4	65.8	22	53.6	+42.9	66.1	22	34.5	+43.9	66.5	22	58.2	+44.6	66.9	32
33	20	44.2	+39.3	63.6	21	30.8	+39.3	63.9	21	37.0	+40.7	64.3	22	02.9	+41.4	64.6	22	28.4	+42.4	65.0	22	53.6	+42.9	65.4	23	18.4	+43.6	65.8	23	42.8	+44.3	66.2	33
34	21	23.5	+38.8	62.8	21	50.7	+39.8	63.1	22	17.7																							

88°, 272° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180° Zn=Z
 { L.H.A. less than 180° Zn= 360° -Z

Dec.	45°			46°			47°			48°			49°			50°			51°			Dec.			
	H	c	d	Z	H	c	d	Z	H	c	d	Z	H	c	d	Z	H	c	d	Z	H	c	d	Z	
0	1	24.8	+42.5	91.4	1	23.4	+43.1	91.4	1	21.8	+43.9	91.5	1	20.3	+44.6	91.5	1	18.7	+45.3	91.5	1	17.1	+46.0	91.5	0
1	2	07.3	+42.4	90.7	2	06.5	+43.2	90.7	2	05.7	+43.9	90.8	2	04.9	+44.6	90.8	2	04.0	+45.3	90.9	2	03.1	+45.9	90.9	1
2	2	49.7	+42.4	90.0	2	49.7	+43.1	90.0	2	49.6	+43.8	90.1	2	49.5	+44.5	90.1	2	49.3	+45.2	90.2	2	49.0	+46.0	90.2	2
3	3	32.1	+42.3	89.3	3	32.8	+43.1	89.4	3	33.4	+43.8	89.4	3	34.0	+44.5	89.5	3	34.5	+45.2	89.5	3	35.0	+45.9	89.6	3
4	4	14.4	+42.3	88.6	4	15.9	+43.0	88.7	4	17.2	+43.8	88.7	4	18.5	+44.5	88.8	4	19.7	+45.2	88.9	4	20.9	+45.9	89.0	4
5	5	46.7	+42.3	87.9	5	58.9	+43.0	88.0	5	61.0	+43.8	88.0	5	63.0	+44.5	88.1	5	64.9	+45.2	88.2	5	66.8	+45.8	88.3	5
6	6	59.0	+42.2	87.2	5	54.9	+43.0	87.3	5	54.8	+43.6	87.4	5	54.7	+44.4	87.5	5	55.1	+45.1	87.6	5	55.6	+46.4	87.8	6
7	6	21.2	+42.2	86.4	6	24.9	+42.9	86.6	6	28.4	+43.7	86.7	6	31.9	+44.3	86.8	6	35.2	+45.0	86.9	6	38.4	+45.7	87.0	7
8	7	03.4	+42.1	85.7	7	07.8	+42.8	85.8	7	12.1	+43.5	86.0	7	16.2	+44.3	86.1	7	20.2	+45.0	86.2	7	24.1	+45.7	86.4	8
9	7	45.5	+42.0	85.0	7	50.6	+42.8	85.1	7	55.6	+43.5	85.3	8	60.5	+44.2	85.4	8	65.8	+45.8	85.7	8	14.2	+46.3	86.0	9
10	8	27.5	+41.9	84.3	8	33.4	+42.7	84.4	8	39.1	+43.5	84.6	8	44.7	+44.2	84.7	8	50.1	+44.9	84.9	8	55.4	+45.6	85.0	10
11	9	09.4	+41.9	83.6	9	16.1	+42.6	83.7	9	22.6	+43.3	83.9	9	28.9	+44.0	84.1	9	35.0	+44.8	84.2	9	46.7	+45.2	84.4	11
12	9	51.3	+41.8	82.8	9	58.7	+42.5	83.0	10	05.9	+43.3	83.2	10	12.9	+44.0	83.4	10	19.8	+44.7	83.5	10	32.9	+46.1	83.9	12
13	10	33.1	+41.6	82.1	10	41.2	+42.4	82.3	10	49.2	+43.1	82.5	10	56.9	+43.9	82.7	11	64.5	+44.6	83.1	11	19.0	+45.9	83.3	13
14	11	14.7	+41.6	81.4	11	23.6	+42.3	81.6	11	32.3	+43.1	81.8	11	40.8	+43.8	82.0	11	49.1	+44.5	82.2	12	04.9	+45.9	82.8	14
15	11	56.3	+41.4	80.6	12	05.9	+42.2	80.8	12	15.4	+42.9	81.1	12	24.6	+43.6	81.3	12	33.6	+44.3	81.5	12	42.3	+45.1	81.7	15
16	12	37.7	+41.3	79.9	12	48.1	+42.1	80.1	12	58.3	+42.8	80.3	13	08.2	+43.6	80.6	13	17.9	+44.3	80.8	13	27.4	+45.0	81.0	16
17	13	19.0	+41.2	79.2	13	30.2	+41.9	79.4	13	41.1	+42.7	79.6	13	51.8	+43.4	79.9	14	02.2	+44.2	80.1	14	22.3	+45.6	80.6	17
18	14	00.2	+41.0	78.4	14	12.1	+41.8	78.7	14	23.8	+42.6	78.9	14	35.2	+43.3	79.2	14	46.4	+44.0	79.4	15	07.9	+45.5	79.9	18
19	14	41.2	+40.9	77.7	14	53.9	+41.7	77.9	15	06.4	+42.4	78.2	15	18.5	+43.2	78.4	15	30.4	+43.9	78.7	15	42.0	+44.7	79.0	19
20	15	22.1	+40.8	76.9	15	35.6	+41.5	77.2	15	48.8	+42.3	77.4	16	01.7	+43.0	77.7	16	14.3	+43.8	78.0	16	26.7	+44.4	78.3	20
21	16	02.9	+40.6	76.1	16	17.1	+41.4	76.4	16	31.1	+42.1	76.7	16	44.7	+42.9	77.0	16	58.1	+43.6	77.3	17	11.1	+44.4	77.6	21
22	16	43.5	+40.4	75.4	16	58.5	+41.2	75.7	17	13.2	+41.9	76.0	17	27.6	+42.7	76.3	17	41.7	+43.4	76.6	17	55.5	+44.2	76.9	22
23	17	23.9	+40.2	74.6	17	39.7	+41.0	74.9	17	55.1	+41.8	75.2	18	10.3	+42.5	75.5	18	25.1	+43.3	75.8	18	39.7	+44.0	76.2	23
24	18	04.1	+40.0	73.8	18	20.7	+40.8	74.1	18	36.9	+41.6	74.4	18	52.8	+42.4	74.8	19	08.4	+43.1	75.1	19	23.7	+43.8	75.4	24
25	18	44.1	+39.9	73.0	19	01.5	+40.6	73.4	19	18.5	+41.4	73.7	19	35.2	+42.2	74.0	19	51.5	+43.0	74.4	20	23.2	+44.4	75.1	25
26	19	24.0	+39.6	72.2	19	42.1	+40.4	72.6	19	59.9	+41.2	72.9	20	17.4	+41.9	73.3	20	34.5	+42.7	73.6	20	51.3	+43.5	74.0	26
27	20	03.6	+39.4	71.4	20	22.5	+40.3	71.8	20	41.1	+41.0	72.1	20	59.3	+41.8	72.5	21	17.2	+42.5	72.9	21	34.7	+43.3	73.3	27
28	20	43.0	+39.2	70.6	21	02.8	+39.9	71.0	21	22.1	+40.8	71.4	21	41.1	+41.6	71.7	21	59.7	+42.3	72.1	22	18.0	+43.0	72.5	28
29	21	22.2	+39.0	69.8	21	42.7	+39.8	70.2	22	02.9	+40.5	70.6	22	22.7	+41.3	71.0	22	42.0	+42.1	71.3	23	01.0	+42.9	71.7	29
30	22	01.2	+38.7	69.0	22	22.5	+39.5	69.4	22	43.4	+40.3	69.8	23	04.0	+41.1	70.2	23	24.1	+41.9	70.6	24	03.2	+43.4	71.4	30
31	22	39.9	+38.4	68.2	23	02.0	+39.3	68.6	23	23.7	+40.1	69.0	23	45.1	+40.8	69.4	24	06.0	+41.6	69.8	24	46.6	+43.2	70.2	31
32	23	18.3	+38.2	67.3	23	41.3	+39.0	67.7	24	03.8	+38.8	68.2	24	25.9	+40.6	68.6	24	47.6	+44.1	69.0	25	29.8	+42.9	69.9	32
33	23	56.5	+37.9	66.5	24	20.3	+38.7	66.9	24	34.6	+39.5	67.3	25	06.5	+40.3	67.8	25	29.0	+41.1	68.2	25	51.1	+41.8	68.6	33
34	24	34.4	+37.7	65.7	24	59.0	+38.4	66.1	25	23.1	+39.2	66.5	25	46.8	+40.1	66.9	26	10.1	+40.8	67.4	26	55.3	+42.4	68.8	34
35	25	12.1	+37.3	64.8	25	37.4	+38.1	65.2	26	02.3	+39.0	65.7	26	26.9	+39.7	66.1	26	50.9	+40.6	66.6	27	14.6	+41.3	67.0	35
36	25	49.4	+37.0	63.9	26	15.5	+37.9	64.4	26	41.3	+38.6	64.8	27	06.6	+39.5	65.5	27	31.5	+40.2	65.7	27	55.9	+41.0	66.2	36
37	26	26.4	+36.7	63.0	26	53.4	+37.5	63.5	27	19.9	+38.4	64.0	27	46.1	+39.1	64.4	28	11.7	+40.0	64.9	28	36.9	+40.8	65.4	37
38	27	03.1	+36.3	62.2	27	30.9	+37.1	62.6	27	58.3	+37.9	63.1	28	25.2	+38.8	63.6	28	51.7	+39.6	64.1	29	43.2	+42.1	65.1	38
39	27	39.4	+36.0	61.3	28	08.0	+36.9	61.7	28	36.2	+37.7	62.2	29	04.0	+38.5	62.7	29	21.3	+39.3	63.2	30	24.4	+40.9	64.8	39
40	28	15.4	+35.6	60.4	28	44.9	+36.4	60.8	29	13.9	+37.3	61.3	29	42.5	+38.1	61.8	30	10.6	+38.9	62.3	30	38.2	+39.7	62.8	40
41	28	51.0	+35.3	59.4	29	21.3	+36.1	59.9	30	20.6	+37.7	60.4	30	49.5	+38.5	61.4	31	17.9	+39.4	62.0	31	45.9	+40.2	62.5	41
42	29	26.3	+34.9	58.5	29	57.4	+35.7	59.0	30	28.1	+36.5	59.5	30	58.3	+37.4	60.0	31	20.8	+38.2	60.5	31	57.3	+39.0	61.1	42
43	30	01.2	+34.4	57.6	30	33.1	+35.3	58.1	31	04.6	+36.2	58.6	31	35.7	+36.9	59.1	32	06.2	+37.8	59.6	33	30.5	+39.4	60.7	33
44	30	35.6	+34.1	56.6	31	18.4	+34.9	57.1	32	34.9	+35.2	57.6	32	35.6	+35.1	58.3	33	22.6	+37.7	59.1	34	45.3	+39.1	59.8	44
45	31	09.7	+33.6	55.7	31	43.3	+34.4	56.2	32	16.5	+35.3	56.7	32	49.2	+36.1	57.2	33	21.4	+37.0	57.8	33	53.1	+37.8	58.3	45
46	31	43.3	+33.2	54.7	32	17.7	+34.1	55.2	32	51.8	+34.8	55.7	33	25.3	+35.7	56.3	33	58.4	+36.5	56.8	34	30.9	+37.4	57.4	46
47	32	16.5	+32.7	53.7	32	51.8	+33.5	54.2	33	26.6	+34.4	54.8	34	01.0	+35.2	55.3	34	34.9	+36.0	55.9	35	30.8	+36.3	56.5	47
48	32	49.2	+32.2	52.7	33	25.3	+33.1	53.2	34	01.0	+33.9	53.8	34	36.2	+34.7	54.3	35	10.9	+35.6	54.9	35	46.2	+38.9	57.1	48
49	33	21.4	+31.7	51.7	33	58.4	+32.5	52.2	34	34.9	+33.4	52.8	35	10.9	+34.3	53.3	35	46.5	+35.1	53.9	36	21.6	+35.9	54.5	49
50	33	53.1	+31.3	50.7	34	30.9	+32.1	51.2	35	08.3	+32.9	51.8	35	45.2	+33.7	52.3	36	21.6	+34.6	52.9	37	33.0	+36.2	54.1	50
51	34	24.4	+30.7	49.7	35	03.0	+31.5	50.2	35	41.2	+32.3	50.7	36	18.9	+33.2	51.0	37	33.0	+34.9	51.5	38	07.9	+37.1	54.8	51
52	34	55.1	+30.1	48.6	35	34.																			

88°, 272° L.H.A.

LATITUDE SAME NAME AS DECLINATION

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 88° , 272°

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			Dec.
	Hc	d	Z																						
0	1 24.8 -42.4	91.4		1 23.4 -43.2	91.4		1 21.8 -43.9	91.5		1 20.3 -44.6	91.5		1 18.7 -45.3	91.5		1 17.1 -46.0	91.5		1 15.5 -46.6	91.6		1 13.9 -47.3	91.6		0
1	0 42.4 -42.5	92.1		0 40.2 -43.2	92.1		0 37.9 -43.9	92.1		0 35.7 -44.6	92.2		0 33.4 -45.3	92.2		0 31.1 -45.9	92.2		0 28.9 -46.7	92.2		0 26.6 -47.3	92.2		1
2	0 00.1 +42.4	87.2		0 03.0 +43.2	87.2		0 06.0 +43.9	87.2		0 08.9 +44.6	87.2		0 11.9 +45.3	87.2		0 14.8 +46.0	87.2		0 17.8 +46.6	87.2		0 20.7 +47.3	87.2		2
3	0 42.5 +42.4	86.5		0 46.2 +43.2	86.5		0 49.9 +43.9	86.5		0 53.5 +44.6	86.5		0 57.2 +45.3	86.5		1 00.8 +46.0	86.5		1 04.4 +46.7	86.6		1 08.0 +47.3	86.6		3
4	1 24.9 +42.5	85.8		1 29.4 +43.1	85.8		1 33.8 +43.9	85.8		1 38.1 +44.6	85.8		1 42.5 +45.3	85.9		1 46.8 +45.9	85.9		1 51.1 +46.6	85.9		1 55.3 +47.3	86.0		4
5	2 07.4 +42.4	85.1		2 12.5 +43.2	85.1		2 17.7 +43.8	85.1		2 22.7 +44.6	85.2		2 27.8 +45.2	85.2		2 32.7 +46.0	85.3		2 37.7 +46.6	85.3		2 42.6 +47.2	85.3		5
6	2 49.8 +42.4	84.3		2 55.7 +43.1	84.4		3 01.5 +43.9	84.4		3 07.3 +44.5	84.5		3 13.0 +45.3	84.6		3 18.7 +45.9	84.6		3 24.3 +46.6	84.7		3 29.8 +47.3	84.7		6
7	3 32.2 +42.3	83.6		3 38.8 +43.1	83.7		3 45.4 +43.8	83.8		3 51.8 +44.6	83.8		3 58.3 +45.2	83.9		4 04.6 +45.9	84.0		4 10.9 +46.5	84.0		4 17.1 +47.2	84.1		7
8	4 14.5 +42.3	82.9		4 21.9 +43.0	83.0		4 29.2 +43.7	83.1		4 36.4 +44.4	83.2		4 43.5 +45.1	83.2		4 50.5 +45.8	83.3		4 57.4 +46.5	83.4		5 04.3 +47.1	83.5		8
9	4 56.8 +42.3	82.2		5 04.9 +43.0	82.3		5 12.9 +43.7	82.4		5 20.8 +44.5	82.5		5 28.6 +45.2	82.6		5 36.3 +45.8	82.7		5 43.9 +46.5	82.8		5 51.4 +47.2	82.9		9
10	5 39.1 +42.2	81.5		5 47.9 +43.0	81.6		5 56.6 +43.7	81.7		6 05.3 +44.3	81.8		6 13.8 +45.0	81.9		6 22.1 +45.8	82.0		6 30.4 +46.4	82.1		6 38.6 +47.0	82.2		10
11	6 21.3 +42.2	80.8		6 30.9 +42.9	80.9		6 40.3 +43.6	81.0		6 49.6 +44.4	81.1		6 58.8 +45.0	81.2		7 07.9 +45.7	81.4		7 16.8 +46.4	81.5		7 25.6 +47.1	81.6		11
12	7 03.5 +42.1	80.1		7 13.8 +42.8	80.2		7 23.9 +43.6	80.3		7 34.0 +44.2	80.4		7 43.8 +45.0	80.6		7 53.6 +45.6	80.7		8 03.2 +46.3	80.9		8 12.7 +46.9	81.0		12
13	7 45.6 +42.0	79.4		7 56.6 +42.8	79.5		8 07.5 +43.5	79.6		8 18.2 +44.2	79.8		8 28.8 +44.9	79.9		8 39.2 +45.6	80.1		8 49.5 +46.3	80.2		8 59.6 +46.9	80.4		13
14	8 27.6 +41.9	78.6		8 39.4 +42.6	78.8		8 51.0 +43.4	78.9		9 02.4 +44.1	79.1		9 13.7 +44.8	79.2		9 24.8 +45.5	79.4		9 35.8 +46.1	79.6		9 46.5 +46.9	79.7		14
15	9 09.5 +41.9	77.9		9 22.0 +42.6	78.1		9 34.4 +43.3	78.2		9 46.5 +44.0	78.4		9 58.5 +44.7	78.6		10 10.3 +45.4	78.7		10 21.9 +46.1	78.9		10 33.4 +46.7	79.1		15
16	9 51.4 +41.8	77.2		10 04.6 +42.5	77.4		10 17.7 +43.2	77.5		10 30.5 +44.0	77.7		10 43.2 +44.7	77.9		10 55.7 +45.4	78.1		11 08.0 +46.0	78.3		11 20.1 +46.7	78.5		16
17	10 33.2 +41.6	76.4		10 47.1 +42.4	76.6		11 00.9 +43.1	76.8		11 14.5 +43.8	77.0		11 27.9 +44.5	77.2		11 41.1 +45.2	77.4		11 54.0 +45.9	77.6		12 06.8 +46.6	77.8		17
18	11 14.8 +41.6	75.7		11 29.5 +42.3	75.9		11 44.0 +43.0	76.1		11 58.3 +43.8	76.3		12 12.4 +44.5	76.5		12 26.3 +45.1	76.7		12 39.9 +45.9	77.0		12 53.4 +46.5	77.2		18
19	11 56.4 +41.4	75.0		12 11.8 +42.2	75.2		12 27.0 +43.0	75.4		12 42.1 +43.6	75.6		12 56.9 +44.3	75.8		13 11.4 +45.1	76.1		13 25.8 +45.7	76.3		13 39.9 +46.4	76.5		19
20	12 37.8 +41.3	74.2		12 54.0 +42.0	74.5		13 10.0 +42.7	74.7		13 25.7 +43.5	74.9		13 41.2 +44.2	75.1		13 56.5 +44.9	75.4		14 11.5 +45.6	75.6		14 26.3 +46.2	75.9		20
21	13 19.1 +41.2	73.5		13 36.0 +42.0	73.7		13 52.7 +42.7	74.0		14 09.2 +43.4	74.2		14 25.4 +44.1	74.4		14 41.4 +44.8	74.7		14 57.1 +45.5	75.0		15 12.5 +46.2	75.2		21
22	14 00.3 +41.0	72.7		14 18.0 +41.8	73.0		14 35.4 +42.5	73.2		14 52.6 +43.2	73.5		15 09.5 +44.0	73.7		15 26.2 +44.6	74.0		15 42.6 +45.3	74.3		15 58.7 +46.0	74.5		22
23	14 41.3 +40.9	72.0		14 59.8 +41.6	72.2		15 17.9 +42.4	72.5		15 38.5 +43.1	72.8		15 53.5 +43.8	73.0		16 10.8 +44.6	73.3		16 27.9 +45.3	73.6		16 44.7 +45.9	73.9		23
24	15 22.2 +40.8	71.2		15 41.4 +41.5	71.5		16 00.3 +42.2	71.8		16 18.9 +43.0	72.0		16 37.3 +43.7	72.3		16 55.4 +44.4	72.6		17 13.2 +45.0	72.9		17 30.6 +45.8	73.2		24
25	16 03.0 +40.6	70.5		16 22.9 +41.3	70.7		16 42.5 +42.1	71.0		17 01.9 +42.8	71.3		17 21.0 +43.5	71.6		17 39.8 +44.2	71.9		17 58.2 +45.0	72.2		18 16.4 +45.6	72.5		25
26	16 43.6 +40.4	69.7		17 04.2 +41.2	70.0		17 24.6 +41.9	70.3		17 44.7 +42.7	70.6		18 04.5 +43.4	70.9		18 24.0 +44.1	71.2		18 43.2 +44.8	71.5		19 02.0 +45.5	71.8		26
27	17 24.0 +40.2	68.9		17 45.4 +41.0	69.2		18 06.5 +41.7	69.5		18 27.4 +42.4	69.8		18 47.9 +43.2	70.2		19 08.1 +43.9	70.5		19 28.0 +44.6	70.8		19 47.5 +45.3	71.1		27
28	18 04.2 +40.0	68.2		18 26.4 +40.8	68.5		18 48.2 +41.6	68.8		19 09.8 +42.3	69.1		19 31.1 +43.0	69.4		19 52.0 +43.7	69.8		20 12.6 +44.4	70.1		20 32.8 +45.2	70.5		28
29	18 44.2 +39.9	67.4		19 07.2 +40.6	67.7		19 29.8 +41.3	68.0		19 52.1 +42.1	68.3		20 14.1 +42.8	68.7		20 35.7 +43.6	69.0		20 57.0 +44.3	69.4		21 18.0 +44.9	69.7		29
30	19 24.1 +39.6	66.6		19 47.8 +40.4	66.9		20 11.1 +41.2	67.2		20 34.2 +41.9	67.6		20 56.9 +42.6	67.9		21 19.3 +43.3	68.3		21 41.3 +44.1	68.7		22 02.9 +44.8	69.0		30
31	20 03.7 +39.4	65.8		20 28.2 +40.1	66.1		20 52.3 +40.9	66.5		21 16.1 +41.7	66.8		21 39.5 +42.4	67.2		22 02.6 +43.2	67.5		22 25.4 +43.8	67.9		22 47.7 +44.6	68.3		31
32	20 43.1 +39.2	65.0		21 08.3 +40.0	65.3		21 33.2 +40.7	65.7		21 57.8 +41.4	66.0		22 21.9 +42.2	66.4		22 45.8 +42.9	66.8		23 09.2 +43.7	67.2		23 32.3 +44.4	67.6		32
33	21 22.3 +39.0	64.2		21 48.3 +39.7	64.5		22 13.9 +40.5	64.9		22 39.2 +41.3	65.3		23 04.1 +42.0	65.6		23 29.7 +43.4	66.4		24 16.5 +44.1	66.6		24 16.7 +44.1	66.8		33
34	22 01.3 +38.4	62.9		23 07.5 +39.2	62.9		23 34.7 +39.9	63.3		24 01.4 +40.8	63.7		24 27.9 +41.5	64.1		24 53.9 +42.2	64.5		25 19.5 +43.0	64.9		25 44.8 +43.7	65.4		35
35	22 40.0 +38.4	62.5		23 07.5 +39.2	62.9		23 34.7 +39.9	63.3		24 01.4 +40.8	63.7		24 27.9 +41.5	64.1		24 53.9 +42.2	64.5		25 19.5 +43.0	64.9		25 44.8 +43.7	65.4		35
36	23 18.4 +38.2	61.7		24 16.6 +38.9	62.1		24 14.6 +39.8	62.5		24 42.2 +40.5	62.9		25 09.4 +41.2	63.3		25 36.1 +42.0	63.7		26 02.5 +42.7	64.1		26 28.5 +43.4	64.6		36
37	23 56.6 +37.9	60.8		24 25.7 +38.7	61.2		24 54.4 +39.4	61.6		25 22.7 +40.2	62.1		25 50.6 +41.0	62.5		26 18.1 +41.7	62.9		26 45.2 +42.5	63.4		27 11.9 +43.2			

89°, 271° L.H.A.

LATITUDE SAME NAME AS DECLINATION

{ L.H.A. greater than 180°Zn=Z
N. Lat. { L.H.A. less than 180°Zn=360°-Z }

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			Dec.			
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z				
0	0	42.4	+42.5	90.7	0	41.7	+43.1	90.7	0	40.9	+43.9	90.7	0	40.1	+44.6	90.7	0	39.4	+45.2	90.8	0	38.6	+45.9	90.8	0	36.9	+47.3	90.8
1	1	24.9	+42.4	90.0	1	24.8	+43.2	90.0	1	24.8	+43.9	90.0	1	24.7	+44.6	90.1	1	24.6	+45.3	90.1	1	24.5	+46.0	90.1	1	24.2	+47.3	90.2
2	2	07.3	+42.4	89.3	2	08.0	+43.1	89.3	2	08.7	+43.8	89.4	2	09.3	+44.6	89.4	2	09.9	+45.3	89.4	2	10.5	+45.9	89.5	2	11.5	+47.2	89.6
3	3	49.7	+42.3	88.6	3	51.1	+43.1	88.6	3	52.5	+43.8	88.7	3	53.9	+44.5	88.7	3	55.2	+45.2	88.8	3	56.4	+45.9	88.9	3	58.7	+47.3	88.9
4	3	32.0	+42.4	87.9	3	34.2	+43.1	87.9	3	36.3	+43.8	88.0	3	38.4	+44.5	88.1	3	40.4	+45.2	88.1	3	42.3	+45.9	88.2	3	44.2	+46.5	88.3
5	4	14.4	+42.3	87.2	4	17.3	+43.0	87.2	4	20.1	+43.8	87.3	4	22.9	+44.5	87.4	4	25.6	+45.2	87.5	4	28.2	+45.9	87.5	4	30.7	+46.6	87.6
6	4	56.7	+42.2	86.5	5	00.3	+43.0	86.5	5	03.9	+43.7	86.6	5	07.4	+44.4	86.7	5	10.8	+45.1	86.8	5	14.1	+45.8	86.9	5	17.3	+46.4	87.0
7	5	38.9	+42.2	85.7	5	43.3	+42.9	85.8	5	47.6	+43.7	85.9	5	51.8	+44.4	86.0	5	55.9	+45.1	86.1	5	59.9	+45.7	86.2	6	03.7	+46.5	86.4
8	6	21.1	+42.1	85.0	6	26.2	+42.9	85.1	6	31.3	+43.8	85.2	6	36.2	+44.5	85.4	6	41.0	+45.0	85.5	6	45.6	+45.8	85.6	6	50.2	+46.4	85.8
9	7	03.2	+42.1	84.3	7	09.1	+42.8	84.4	7	14.9	+43.5	84.6	7	20.5	+44.3	84.7	7	26.0	+45.0	84.8	7	31.4	+45.6	84.9	7	36.6	+46.3	85.1
10	7	45.3	+42.0	83.6	7	51.9	+42.8	83.7	7	58.4	+43.5	83.9	8	04.8	+44.2	84.0	8	11.0	+44.9	84.1	8	17.0	+45.6	84.3	8	22.9	+46.3	84.4
11	8	27.3	+41.9	82.9	8	34.7	+42.7	83.0	8	41.9	+43.4	83.2	8	49.0	+44.1	83.3	8	55.9	+44.8	83.5	9	02.6	+45.5	83.6	9	09.2	+46.2	83.8
12	9	09.2	+41.9	82.1	9	17.4	+42.5	82.3	9	25.3	+43.3	82.5	9	33.1	+44.0	82.6	9	40.7	+44.7	82.8	9	48.1	+45.5	83.0	10	02.4	+46.8	83.3
13	9	51.1	+41.7	81.4	9	59.9	+42.5	81.6	10	08.6	+43.2	81.8	10	17.1	+44.0	81.9	10	25.4	+44.7	82.1	10	41.5	+46.0	82.5	10	49.2	+46.7	82.7
14	10	32.8	+41.6	80.7	10	42.4	+42.4	80.9	10	51.8	+43.2	81.1	11	01.1	+43.8	81.3	11	10.1	+44.6	81.4	11	18.9	+45.3	81.6	11	35.9	+46.7	82.0
15	11	14.4	+41.6	80.0	11	24.8	+42.3	80.2	11	35.0	+43.0	80.4	11	44.9	+43.8	80.6	11	54.7	+44.8	80.8	12	04.2	+45.2	81.0	12	13.5	+45.9	81.2
16	11	56.0	+41.4	79.2	12	07.1	+42.2	79.4	12	18.0	+42.9	79.6	12	28.7	+43.6	79.9	12	39.1	+44.4	80.1	12	49.4	+45.0	80.3	13	09.1	+46.5	80.8
17	12	37.4	+41.3	78.5	12	49.3	+42.0	78.7	13	00.9	+42.8	78.9	13	12.3	+43.6	79.2	13	23.5	+44.2	79.4	13	34.4	+45.0	79.6	13	45.1	+45.7	79.9
18	13	18.7	+41.2	77.7	13	31.3	+41.9	78.0	13	43.7	+42.7	78.2	13	55.9	+43.4	78.4	14	07.7	+44.2	78.7	14	19.4	+44.8	78.9	14	30.8	+45.5	79.2
19	13	59.9	+41.0	77.0	14	13.2	+41.8	77.2	14	26.4	+42.5	77.5	14	39.3	+43.2	77.7	14	51.9	+44.0	78.0	15	04.2	+44.7	78.3	15	28.1	+46.1	78.8
20	14	40.9	+40.9	76.2	14	55.0	+41.7	76.5	15	08.9	+42.4	76.7	15	22.5	+43.2	77.0	15	35.9	+43.8	77.3	15	48.9	+44.6	77.6	16	14.2	+46.0	78.1
21	15	21.8	+40.7	75.5	15	36.7	+41.5	75.7	15	51.3	+42.3	76.0	16	05.7	+43.0	76.3	16	19.7	+43.8	76.6	16	33.5	+44.5	76.9	16	47.0	+45.2	77.2
22	16	02.5	+40.5	74.7	16	18.2	+41.3	75.0	16	33.6	+42.0	75.3	16	48.7	+42.8	75.6	17	03.5	+43.5	75.9	17	18.0	+44.3	76.2	17	32.2	+45.0	76.5
23	16	43.0	+40.4	73.9	16	59.5	+41.1	74.2	17	15.6	+42.0	74.5	17	31.5	+42.7	74.8	17	47.0	+43.4	75.1	18	02.3	+44.1	75.5	18	17.2	+44.8	75.8
24	17	23.4	+40.2	73.2	17	40.6	+41.0	73.5	17	57.6	+41.7	73.8	18	14.2	+42.5	74.1	18	30.4	+43.3	74.4	18	46.4	+44.0	74.7	19	02.0	+44.7	75.4
25	18	03.6	+40.0	72.4	18	21.6	+40.8	72.7	18	39.3	+41.6	73.0	18	56.7	+42.3	73.3	19	13.7	+43.1	73.7	19	30.4	+43.8	74.0	20	02.7	+45.3	74.7
26	18	43.6	+39.9	71.6	19	02.4	+40.6	71.9	19	20.9	+41.3	72.3	19	39.0	+42.1	72.6	19	56.8	+42.8	72.9	20	14.2	+43.6	73.3	20	31.3	+44.3	73.6
27	19	23.5	+39.6	70.8	19	43.0	+40.4	71.1	20	02.2	+41.2	71.5	20	21.1	+42.0	71.8	20	39.6	+42.7	72.2	20	57.8	+43.4	72.6	21	15.6	+44.2	72.9
28	20	03.1	+39.4	70.0	20	23.4	+40.2	70.4	20	43.4	+41.0	70.7	21	03.1	+41.7	71.1	21	22.3	+42.5	71.4	21	41.4	+43.2	71.8	21	59.8	+43.9	72.2
29	20	42.5	+39.2	69.2	21	03.6	+40.0	69.6	21	24.4	+40.7	69.9	21	44.8	+41.5	70.3	22	04.8	+42.3	70.7	22	24.5	+43.0	71.1	23	02.6	+44.5	71.9
30	21	21.7	+38.9	68.4	21	43.6	+39.7	68.8	22	05.1	+40.5	69.1	22	26.3	+41.3	69.5	22	47.1	+42.0	69.9	23	07.5	+42.8	70.3	23	27.5	+43.6	70.7
31	22	00.6	+38.7	67.6	22	23.3	+39.5	68.0	22	45.6	+40.3	68.3	23	07.6	+41.0	68.7	23	29.1	+43.0	69.1	23	50.3	+42.6	69.5	24	11.1	+43.3	70.0
32	22	39.3	+38.4	66.8	23	02.8	+39.2	67.1	23	25.9	+40.0	67.5	23	48.6	+40.8	67.9	24	11.0	+41.5	68.4	24	32.9	+42.3	68.8	25	15.5	+43.8	69.6
33	23	17.7	+38.2	65.9	23	42.0	+39.0	66.3	24	05.9	+39.8	66.7	24	29.4	+40.6	67.1	25	52.5	+41.3	67.6	25	15.2	+42.1	68.0	26	42.9	+43.6	68.9
34	23	55.9	+37.9	65.1	24	21.0	+38.7	65.5	24	45.7	+39.4	65.9	25	10.0	+40.2	66.3	25	33.8	+41.1	66.8	25	57.3	+41.8	67.2	26	20.3	+42.6	67.7
35	24	33.8	+37.6	64.2	24	59.7	+38.4	64.6	25	25.1	+39.3	65.1	25	50.2	+40.0	65.5	26	39.1	+41.6	66.4	26	70.9	+42.4	66.9	27	26.3	+43.1	67.3
36	25	11.4	+37.3	63.4	25	28.1	+38.1	63.8	26	04.4	+38.9	64.2	26	30.2	+39.7	64.7	26	55.7	+40.5	65.1	27	20.7	+41.3	65.6	27	45.3	+43.0	66.1
37	25	48.7	+36.9	62.5	26	16.2	+37.8	62.9	26	43.3	+39.4	63.4	27	09.9	+39.4	63.8	27	36.2	+40.2	64.3	28	02.0	+40.9	64.8	28	27.3	+41.8	65.3
38	26	26.6	+36.7	61.6	27	21.9	+38.2	62.5	27	49.3	+39.1	63.0	28	16.4	+39.8	63.5	28	42.9	+40.7	63.9	29	09.1	+41.4	64.4	29	34.7	+42.2	65.0
39	27	02.3	+36.3	60.7	28	31.4	+37.6	61.2	2																			

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 89° , 271°

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			Dec.								
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z									
	°	'	"	°	'	"	°	'	"	°	'	"	°	'	"	°	'	"	°	'	"	°	'	"									
0	0	42.4	-42.4	90.7	0	41.7	-43.2	90.7	0	40.9	-43.9	90.7	0	40.1	-44.5	90.7	0	39.4	-45.3	90.8	0	38.6	-46.0	90.8	0	37.8	-46.7	90.8	0	36.9	-47.2	90.8	0
1	0	0.0	-0.2	91.4	0	0.15	+43.2	88.6	0	0.30	+43.9	88.6	0	0.44	+44.6	88.6	0	0.59	+45.3	88.6	0	0.74	+46.0	88.6	0	0.89	+46.6	88.6	0	10.3	+47.3	88.6	1
2	0	42.4	+42.5	87.9	0	44.7	+43.1	87.9	0	46.9	+43.8	87.9	0	49.0	+44.6	87.9	0	51.2	+45.3	87.9	0	53.4	+45.9	87.9	0	55.5	+46.6	88.0	0	57.6	+47.3	88.0	2
3	1	24.9	+42.4	87.2	1	27.8	+43.2	87.2	1	30.7	+43.9	87.2	1	33.6	+44.6	87.2	1	36.5	+45.3	87.3	1	39.3	+46.0	87.3	1	42.1	+46.6	87.3	1	44.9	+47.3	87.4	3
4	2	07.3	+42.4	86.5	2	11.0	+43.1	86.5	2	14.6	+43.8	86.5	2	18.2	+44.6	86.6	2	21.8	+45.2	86.6	2	25.3	+45.9	86.7	2	28.7	+46.6	86.7	2	32.2	+47.2	86.7	4
5	2	49.7	+42.3	85.8	2	54.1	+43.1	85.8	2	58.4	+43.9	85.9	3	0.28	+44.5	85.9	3	0.70	+45.2	86.0	3	1.12	+45.9	86.0	3	1.53	+46.6	86.1	3	1.94	+47.2	86.1	5
6	3	32.0	+42.4	85.0	3	37.2	+43.1	85.1	3	42.3	+43.8	85.2	3	47.3	+44.5	85.2	3	52.2	+45.2	85.3	3	57.1	+45.9	85.4	4	0.19	+46.6	85.4	4	0.66	+47.2	85.5	6
7	4	14.4	+42.3	84.3	4	20.3	+43.0	84.4	4	26.1	+43.7	84.5	4	31.8	+44.4	84.6	4	37.4	+45.2	84.6	4	43.0	+45.8	84.7	4	48.5	+46.5	84.8	4	53.8	+47.2	84.9	7
8	4	56.7	+42.3	83.6	5	0.3	+43.0	83.7	5	9.0	+43.7	83.8	5	16.2	+44.5	83.9	5	22.6	+45.1	84.0	5	28.8	+45.8	84.1	5	35.0	+46.4	84.2	5	41.0	+47.1	84.3	8
9	5	38.9	+42.2	82.9	5	46.3	+42.9	83.0	5	53.5	+43.7	83.1	6	0.07	+44.3	83.2	6	0.77	+45.1	83.3	6	1.46	+45.8	83.4	6	21.4	+46.4	83.5	6	28.1	+47.1	83.7	9
10	6	21.1	+42.2	82.2	6	29.2	+42.9	82.3	6	37.2	+43.6	82.4	6	45.0	+44.3	82.5	6	52.8	+45.0	82.7	7	0.04	+45.7	82.8	7	0.78	+46.4	82.9	7	15.2	+47.0	83.0	10
11	7	03.3	+42.0	81.5	7	12.1	+42.8	81.6	7	20.8	+43.5	81.7	7	29.3	+44.3	81.9	7	37.8	+44.9	82.0	7	46.1	+45.6	82.1	7	54.2	+46.3	82.3	8	0.22	+47.0	82.4	11
12	7	45.3	+42.0	80.8	7	54.9	+42.7	80.9	8	0.43	+43.5	81.0	8	13.6	+44.2	81.2	8	22.7	+45.9	81.3	8	31.7	+46.5	81.5	8	40.5	+46.6	81.6	8	49.2	+46.8	81.8	12
13	8	27.3	+41.9	80.0	8	37.6	+42.7	80.2	8	47.8	+43.4	80.3	8	57.8	+44.1	80.5	9	07.6	+44.8	80.6	9	17.3	+45.5	80.8	9	26.8	+46.1	81.0	9	36.1	+46.8	81.1	13
14	9	09.2	+41.9	79.3	9	20.3	+42.6	79.5	9	31.2	+43.3	79.6	9	41.9	+44.0	79.8	9	52.4	+44.7	80.0	10	02.8	+45.4	80.1	10	12.9	+46.1	80.3	10	22.9	+46.8	80.5	14
15	9	51.1	+41.7	78.6	10	0.29	+42.4	78.8	10	14.5	+43.2	78.9	10	25.9	+43.9	79.1	10	37.1	+44.7	79.3	10	48.2	+45.3	79.5	10	59.0	+46.0	79.7	11	09.7	+46.7	79.9	15
16	10	32.8	+41.7	77.9	10	45.3	+42.4	78.0	11	57.7	+43.1	78.2	11	09.8	+43.9	78.4	11	21.8	+44.5	78.6	11	33.5	+45.2	78.8	11	45.0	+46.0	79.0	11	56.4	+46.6	79.2	16
17	11	14.5	+41.5	77.1	11	27.7	+42.3	77.3	11	40.8	+43.0	77.5	11	53.7	+43.7	77.7	12	06.3	+43.5	77.9	12	18.7	+45.2	78.1	12	31.0	+45.8	78.4	12	43.0	+46.5	78.6	17
18	11	56.0	+41.4	76.4	12	10.0	+42.2	76.6	12	23.8	+42.9	76.8	12	37.4	+43.6	77.0	12	50.8	+44.3	77.2	13	03.9	+45.0	77.5	13	16.8	+45.7	77.7	13	29.5	+46.3	77.9	18
19	12	37.4	+41.3	75.6	12	52.2	+42.0	75.9	13	06.7	+42.8	76.1	13	21.0	+43.5	76.3	13	35.1	+44.2	76.6	13	48.9	+44.9	76.8	14	02.5	+45.6	77.0	14	15.8	+46.3	77.3	19
20	13	18.7	+41.2	74.9	13	34.2	+41.9	75.1	13	49.5	+42.6	75.4	14	04.5	+43.4	75.6	14	19.3	+44.1	75.9	14	33.8	+44.8	76.1	14	48.1	+45.5	76.4	15	02.1	+46.2	76.6	20
21	13	59.9	+41.0	74.2	14	16.1	+41.8	74.4	14	32.1	+42.6	74.6	14	47.9	+43.2	74.9	15	03.4	+44.0	75.2	15	18.6	+44.7	75.4	15	33.6	+45.4	75.7	15	48.3	+46.1	76.0	21
22	14	40.9	+40.9	73.4	14	57.9	+41.6	73.7	15	14.7	+42.3	73.9	15	31.1	+43.2	74.2	15	47.4	+43.8	74.4	16	03.3	+44.6	74.7	16	19.0	+45.2	75.0	16	34.4	+45.9	75.3	22
23	15	21.8	+40.7	72.6	15	39.5	+41.5	72.9	15	57.0	+42.2	73.2	16	14.3	+42.9	73.5	16	31.2	+43.7	73.7	16	47.9	+44.4	74.0	17	04.2	+45.1	74.3	17	20.3	+45.8	74.6	23
24	16	0.25	+40.5	71.9	16	21.0	+41.3	72.2	16	39.3	+42.0	72.4	16	57.2	+42.8	72.7	17	14.9	+43.5	73.0	17	32.3	+44.2	73.3	17	49.3	+45.0	73.6	18	06.1	+45.6	73.9	24
25	16	43.0	+40.4	71.1	17	0.23	+41.2	71.7	17	40.0	+42.7	72.0	17	58.4	+43.4	72.3	18	16.5	+44.1	72.6	18	34.3	+44.8	72.9	18	51.7	+45.5	73.3	25				
26	17	23.4	+40.2	70.3	17	43.5	+40.9	70.6	18	0.32	+41.7	70.9	18	22.7	+42.4	71.3	18	41.8	+43.2	71.6	19	0.06	+43.9	71.9	19	19.1	+44.6	72.2	19	37.2	+45.3	72.6	26
27	18	0.36	+40.1	69.6	18	24.4	+40.8	69.9	18	44.9	+41.6	70.2	19	05.1	+42.3	70.5	19	25.0	+43.0	70.8	20	0.37	+44.5	71.2	20	22.5	+45.2	71.9	27				
28	18	43.7	+39.8	68.8	19	05.2	+40.6	69.1	19	26.5	+41.3	69.4	19	47.4	+42.1	69.8	20	08.0	+42.8	70.1	20	28.3	+43.5	70.4	20	48.2	+44.2	70.8	21	07.7	+45.0	71.2	28
29	19	23.5	+39.6	68.0	19	45.8	+40.4	68.3	20	0.78	+41.2	68.7	20	29.5	+41.9	69.0	20	50.8	+42.7	69.3	21	11.8	+43.4	69.7	21	32.4	+44.1	70.1	21	52.7	+44.8	70.5	29
30	20	0.31	+39.4	67.2	20	26.2	+40.2	67.5	20	49.0	+40.9	67.9	21	11.4	+41.7	68.2	21	33.5	+42.4	68.6	21	55.2	+43.1	69.0	22	16.5	+43.9	69.3	22	37.5	+44.6	69.7	30
31	20	42.5	+39.2	66.4	21	06.4	+39.9	66.7	21	29.9	+40.7	67.1	21	53.1	+41.4	67.5	22	15.9	+42.2	67.8	22	38.3	+43.0	68.2	23	00.4	+43.7	68.9	31				
32	21	21.7	+38.9	65.6	21	46.3	+39.7	65.9	22	10.6	+40.5	66.3	22	51.1	+41.0	65.9	22	58.1	+42.0	67.1	23	21.3	+42.7	67.5	24	44.1	+43.5	68.3	32				
33	22	0.06	+38.7	64.8	34	0.08	+32.5	48.0	34	40.8	+33.3	48.5	35	20.4	+34.0	49.0	35																

90°, 270° L.H.A.

LATITUDE SAME NAME AS DECLINATION

Lat. { L.H.A. greater than 180° Zn=Z
 { L.H.A. less than 180° Zn= $360^{\circ}-Z$

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			Dec.
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	
0	0	0.00	+42.4	90.0	0	0.00	+43.2	90.0	0	0.00	+43.9	90.0	0	0.00	+44.6	90.0	0	0.00	+46.6	90.0	0	0.00	+47.3	90.0	0
1	0	42.4	+42.4	89.3	0	43.2	+43.1	89.3	0	43.9	+43.9	89.3	0	44.6	+44.6	89.3	0	45.3	+45.3	89.3	0	46.0	+45.9	89.4	0
2	1	24.8	+42.5	88.6	1	26.3	+43.2	88.6	1	27.8	+43.8	88.6	1	29.2	+44.5	88.7	1	30.6	+45.2	88.7	1	31.9	+46.0	88.7	1
3	2	07.3	+42.3	87.9	2	09.5	+43.1	87.9	2	11.6	+43.9	88.0	2	13.7	+44.6	88.0	2	15.8	+45.3	88.0	2	17.9	+45.9	88.1	2
4	2	49.6	+42.4	87.2	2	52.6	+43.1	87.2	2	55.5	+43.8	87.3	2	58.3	+44.5	87.3	3	01.1	+45.2	87.4	3	03.8	+45.9	87.4	3
5	3	32.0	+42.3	86.5	3	35.7	+43.0	86.5	3	39.3	+43.8	86.6	3	42.8	+44.5	86.6	3	46.3	+45.2	86.7	3	49.7	+45.9	86.8	3
6	4	14.3	+42.3	85.7	4	18.7	+43.1	85.8	4	23.1	+43.7	85.9	4	27.3	+44.5	86.0	4	31.5	+45.1	86.1	4	35.6	+45.8	86.2	4
7	4	56.6	+42.3	85.0	5	01.8	+42.9	85.1	5	06.8	+43.7	85.2	5	11.8	+44.4	85.3	5	16.6	+45.2	85.4	5	21.4	+45.8	85.5	5
8	5	38.9	+42.1	84.3	5	44.7	+43.0	84.4	5	50.5	+43.7	84.5	5	56.2	+44.4	84.6	6	01.8	+45.0	84.7	6	07.2	+45.8	84.8	6
9	6	21.0	+42.2	83.6	6	27.7	+42.8	83.7	6	34.2	+43.6	83.8	6	40.6	+44.3	84.0	6	46.8	+45.0	84.1	6	53.0	+45.7	84.2	6
10	7	03.2	+42.0	82.9	7	10.5	+42.8	83.0	7	17.8	+43.5	83.1	7	24.9	+44.2	83.3	7	31.8	+45.0	83.4	7	38.7	+45.6	83.5	7
11	7	45.2	+42.0	82.2	7	53.3	+42.8	82.3	8	01.3	+43.5	82.4	8	09.1	+44.2	82.6	8	16.8	+44.9	82.7	8	24.3	+45.6	82.9	8
12	8	27.2	+42.0	81.5	8	36.1	+42.6	81.6	8	44.8	+43.4	81.8	8	53.3	+44.1	81.9	9	01.7	+44.8	82.1	9	09.9	+45.5	82.2	9
13	9	09.2	+41.8	80.7	9	18.7	+42.6	80.9	9	28.2	+43.3	81.1	9	37.4	+44.0	81.2	9	46.5	+44.7	81.4	9	55.4	+45.4	81.6	10
14	9	51.0	+41.7	80.0	10	01.3	+42.5	80.2	10	11.5	+43.2	80.3	10	21.4	+44.0	80.5	10	31.2	+44.7	80.7	10	40.8	+45.3	80.9	10
15	10	32.7	+41.7	79.3	10	43.8	+42.4	79.5	10	54.7	+43.1	79.6	11	05.4	+43.8	79.8	11	15.9	+44.5	80.0	11	26.1	+45.3	80.2	11
16	11	14.4	+41.5	78.5	11	26.2	+42.2	78.7	11	37.8	+43.0	78.9	11	49.2	+43.7	79.1	12	00.4	+44.5	79.3	12	11.4	+45.1	79.6	12
17	11	55.9	+41.4	77.8	12	08.4	+42.2	78.0	12	20.8	+42.9	78.2	12	32.9	+43.7	78.4	12	44.9	+44.3	78.7	12	56.5	+45.1	78.9	13
18	12	37.3	+41.3	77.1	12	50.6	+42.0	77.3	13	03.7	+42.8	77.5	13	16.6	+43.5	77.7	13	29.2	+44.2	78.0	13	41.6	+44.9	78.2	13
19	13	18.6	+41.1	76.3	13	32.6	+42.0	76.5	13	46.5	+42.6	76.8	14	00.1	+43.4	77.0	14	13.4	+44.1	77.3	14	26.5	+44.8	77.5	14
20	13	59.7	+41.0	75.6	14	14.6	+41.7	75.8	14	29.1	+42.6	76.1	14	43.5	+43.2	76.3	14	57.5	+44.0	76.6	15	11.3	+44.7	76.8	15
21	14	40.7	+40.9	74.8	14	56.3	+41.7	75.1	15	11.7	+42.3	75.3	15	26.7	+43.1	75.6	15	41.5	+43.9	75.9	15	56.0	+44.6	76.1	16
22	15	21.6	+40.7	74.1	15	38.0	+41.4	74.3	15	54.0	+42.3	74.6	16	09.8	+43.0	74.9	16	25.4	+43.7	75.2	16	40.6	+44.4	75.4	16
23	16	02.3	+40.6	73.3	16	19.4	+41.4	73.6	16	36.3	+42.0	73.9	16	52.8	+42.8	74.1	17	09.1	+43.5	74.4	17	20.5	+44.3	74.7	17
24	16	42.9	+40.4	72.5	17	00.8	+41.1	72.8	17	18.3	+41.9	73.1	17	35.6	+42.7	73.4	17	52.6	+43.4	73.7	18	09.3	+44.1	74.0	18
25	17	23.3	+40.2	71.8	17	41.9	+41.0	72.1	18	00.2	+41.8	72.4	18	18.3	+42.4	72.7	18	36.0	+43.2	73.0	18	10.4	+44.7	73.6	19
26	18	03.5	+40.0	71.0	18	22.9	+40.8	71.3	18	42.0	+41.5	71.6	19	00.7	+42.3	71.9	19	19.2	+43.0	72.3	19	37.3	+43.8	72.6	19
27	18	43.5	+39.8	70.2	19	03.7	+40.5	70.5	19	23.5	+41.4	70.8	19	43.0	+42.1	71.2	20	02.2	+42.9	71.5	20	21.1	+43.6	71.9	20
28	19	23.3	+39.6	69.4	19	44.2	+40.4	69.7	20	04.9	+41.1	70.1	20	25.1	+42.0	70.4	21	45.1	+42.6	70.8	21	23.9	+44.1	71.1	21
29	20	0.9	+39.4	68.6	20	24.6	+40.2	68.9	20	46.0	+41.0	69.3	21	07.1	+41.7	69.6	21	27.7	+42.5	70.0	21	48.1	+43.2	70.4	22
30	20	42.3	+39.2	67.8	21	04.8	+39.9	68.1	21	27.0	+40.7	68.5	21	48.8	+41.4	68.9	22	10.2	+42.2	69.3	22	51.9	+43.8	69.6	23
31	21	21.5	+38.9	67.0	21	44.7	+39.8	67.3	22	07.7	+40.5	67.7	22	30.2	+41.3	68.1	22	52.4	+42.0	68.5	23	35.7	+43.5	69.3	23
32	22	0.04	+38.7	66.2	22	24.5	+39.4	66.5	22	48.2	+40.2	66.9	23	11.5	+41.0	67.3	23	34.4	+41.8	67.7	24	19.2	+43.2	68.5	24
33	22	39.1	+38.4	65.3	23	03.9	+39.2	65.7	23	28.4	+40.0	66.1	23	52.5	+40.8	66.5	24	16.2	+41.6	66.9	24	39.5	+42.3	67.3	25
34	23	17.5	+38.1	64.5	23	43.1	+39.0	64.9	24	08.4	+39.7	65.3	24	33.3	+40.5	65.7	24	57.8	+41.2	66.1	25	21.8	+42.1	66.6	25
35	23	55.6	+37.6	63.7	24	22.1	+38.7	64.1	24	48.1	+39.5	64.5	25	13.8	+40.2	64.9	25	39.0	+41.8	65.3	26	28.3	+42.5	66.2	26
36	24	33.5	+37.6	62.8	25	00.8	+38.3	63.2	25	27.6	+39.2	63.6	25	54.0	+40.0	64.1	26	20.1	+40.7	64.5	26	45.7	+41.5	65.0	27
37	25	11.1	+37.3	61.9	25	39.1	+38.1	62.4	26	06.8	+38.8	62.8	26	34.0	+39.7	63.2	27	00.8	+40.4	63.7	27	53.1	+42.0	64.6	27
38	25	48.4	+37.0	61.1	26	17.2	+37.8	61.5	26	45.6	+38.6	61.9	27	13.7	+39.3	62.4	27	41.2	+40.2	62.9	28	0.9	+40.9	63.3	28
39	26	25.4	+36.6	60.2	26	55.0	+37.5	60.6	27	24.2	+38.3	61.1	27	53.0	+39.1	61.5	28	21.4	+39.9	62.0	28	49.3	+40.6	62.5	29
40	27	0.20	+36.4	59.3	27	32.5	+37.1	59.8	28	02.5	+37.9	60.2	28	32.1	+38.7	60.7	29	01.2	+39.5	61.7	29	58.2	+41.0	62.2	30
41	27	38.4	+35.9	58.4	28	09.6	+36.7	58.9	28	40.4	+37.6	59.3	29	10.8	+38.3	59.8	29	40.7	+39.2	60.3	30	39.2	+40.8	61.3	41
42	28	14.3	+35.6	57.5	28	46.3	+36.5	58.0	29	18.0	+37.2	58.4	29	49.1	+38.0	58.9	30	52.0	+39.6	59.9	31	20.0	+40.4	60.5	31
43	28	49.9	+35.5	56.6	29	29.8	+36.0	57.1	30	27.1	+37.7	57.5	30	57.8	+38.4	58.5	31	29.8	+39.2	59.1	32	00.4	+40.8	59.6	32
44	29	25.2	+34.8	55.7	30	32.0	+36.5	56.6	31	31.0	+37.2	57.1	31	37.1	+38.1	57.6	32	09.0	+38.9	58.2	32	40.4	+39.7	58.7	33
45	30	0.00	+34.4	54.7	30	34.4	+35.3	55.2	31	08.5	+36.0	55.7	32	41.0	+36.4	56.2	32	15.2	+37.6	56.7	32	47.9	+38.4	57.3	33
46	30	34.4	+34.1	53.8	31	41.4	+35.6	54.8	32	18.9	+36.4	55.3	33	52.8	+37.3	55.8	33	26.3	+38.1	56.4	33	59.3	+38.9	56.9	34
47	31	08.5	+33.5	52.8	31	32.0	+35.2	53.8	32	55.3	+36.0	54.3	33	30.1	+36.8	54.9	34	04.4	+37.4	55.4	34	38.2	+38.4	56.0	35
48	31	42.0	+33.2	51.9	32	18.9	+33.9	52.3	32	55.3	+34.8	52.9	33	31.3	+35.6	53.4	34	06.9	+36.4	53.9	35	16.6	+38.0	55.0	35
49	32	15.2	+32.7	50.9	32	52.8	+33.5	51.4	33	30.1	+34.3	51.9	34	46.3	+35.2	52.4	35	19.2	+36.7	53.5	35	54.6	+37.6	54.1	36
50	32	47.9	+32.9	49.9	33	26.3	+33.0	50.4	34	04.4	+33.8	50.9	34	42.0	+34.6	51.4	35	55.9	+36.3	52.5	36	32.2	+37.0	53.1	37
51	33	20.1	+31.7	48.9	33	59.3	+32.5	49.4	34	38.2	+33.3	49.9	35	16.6	+34.1	50.4	36	32.2	+35.7	51.6	37	45.8	+36.2	52.8	37
52	33	51.																							

90°, 270° L.H.A.

LATITUDE SAME NAME AS DECLINATION

LATITUDE *CONTRARY NAME TO DECLINATION

L.H.A. 90°, 270°

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			Dec.				
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z					
°	'	"	°	'	"	°	'	"	°	'	"	°	'	"	°	'	"	°	'	"	°	'	"	°	'	"			
0	0	00.0	+42.4	90.0	0	00.0	+43.2	90.0	0	00.0	+43.9	90.0	0	00.0	+44.6	90.0	0	00.0	+45.3	90.0	0	00.0	+46.6	90.0	0	00.0	+47.3	90.0	0
1	0	42.4	+42.4	89.3	0	43.2	+43.1	89.3	0	43.9	+43.9	89.3	0	44.6	+44.6	89.3	0	45.3	+45.3	89.3	0	46.0	+45.9	89.4	0	46.6	+46.7	89.4	1
2	1	24.8	+42.5	88.6	1	26.3	+43.2	88.6	1	27.8	+43.8	88.6	1	29.2	+44.5	88.7	1	30.6	+45.2	88.7	1	31.9	+46.0	88.7	1	33.3	+46.6	88.7	1
3	2	07.3	+42.3	87.9	2	09.5	+43.1	87.9	2	11.6	+43.9	88.0	2	13.7	+44.6	88.0	2	15.8	+45.3	88.0	2	17.9	+45.9	88.1	2	19.9	+46.6	88.1	3
4	2	49.6	+42.4	87.2	2	52.6	+43.1	87.2	2	55.5	+43.8	87.3	2	58.3	+44.5	87.3	2	61.1	+45.2	87.4	3	03.8	+45.9	87.4	3	06.5	+46.5	87.5	4
5	3	32.0	+42.3	86.5	3	35.7	+43.0	86.5	3	39.3	+43.8	86.6	3	42.8	+44.5	86.6	3	46.3	+45.2	86.7	3	49.7	+45.9	86.8	3	53.0	+46.6	86.8	5
6	4	14.3	+42.3	85.7	4	18.7	+43.1	85.8	4	23.1	+43.7	85.9	4	27.3	+44.5	86.0	4	31.5	+45.1	86.1	4	35.6	+45.8	86.1	4	39.6	+46.5	86.2	6
7	4	56.6	+42.3	85.0	5	01.8	+42.9	85.1	5	06.8	+43.7	85.2	5	11.8	+44.4	85.3	5	16.6	+45.2	85.4	5	21.4	+45.8	85.5	5	26.1	+46.4	85.6	7
8	5	38.9	+42.1	84.3	5	44.7	+43.0	84.4	5	50.5	+43.7	84.5	5	56.2	+44.4	84.6	6	01.8	+45.0	84.7	6	07.2	+45.8	84.8	6	12.5	+46.5	84.9	8
9	6	21.0	+42.2	83.6	6	27.7	+42.8	83.7	6	34.2	+43.6	83.8	6	40.6	+44.3	84.0	6	46.8	+45.0	84.1	6	53.0	+45.7	84.2	6	59.0	+46.3	84.3	9
10	7	03.2	+42.0	82.9	7	10.5	+42.8	83.0	7	17.8	+43.5	83.1	7	24.9	+44.2	83.3	7	31.8	+45.0	83.4	7	38.7	+45.6	83.5	7	45.3	+46.4	83.7	10
11	7	45.2	+42.0	82.2	7	53.3	+42.8	82.3	8	01.3	+43.5	82.4	8	09.1	+44.2	82.6	8	16.8	+44.9	82.7	8	24.3	+45.6	82.9	8	31.7	+46.2	83.0	11
12	8	27.2	+42.0	81.5	8	36.1	+42.8	81.6	8	44.8	+43.4	81.8	8	53.3	+44.1	81.9	9	01.7	+42.8	82.1	9	09.9	+45.5	82.2	9	17.9	+46.2	82.4	12
13	9	09.2	+41.8	80.7	9	18.7	+42.6	80.9	9	28.2	+43.3	81.1	9	37.4	+44.0	81.2	9	46.5	+44.7	81.4	9	55.4	+45.4	81.6	10	04.1	+46.1	81.7	13
14	9	51.0	+41.7	80.0	10	01.3	+42.5	80.2	10	11.5	+43.2	80.3	10	21.4	+44.0	80.5	10	31.2	+44.7	80.7	10	40.8	+45.3	80.9	10	50.2	+46.0	81.1	14
15	10	32.7	+41.7	79.3	10	43.8	+42.4	79.5	10	54.7	+43.1	79.6	11	05.4	+43.8	79.8	11	15.9	+44.5	80.0	11	26.1	+45.3	80.2	11	36.2	+46.0	80.4	15
16	11	14.4	+41.5	78.5	11	26.2	+42.2	78.7	11	37.8	+43.0	78.9	11	49.2	+43.7	79.1	12	00.4	+44.5	79.3	12	11.4	+45.1	79.6	12	22.2	+45.8	79.8	16
17	11	55.9	+41.4	77.8	12	08.4	+42.2	78.0	12	20.8	+42.9	78.2	12	32.9	+43.7	78.4	12	44.9	+44.3	78.7	12	56.5	+45.1	78.9	13	08.0	+45.7	79.1	17
18	12	37.3	+41.3	77.1	12	50.6	+42.0	77.3	13	03.7	+42.8	77.5	13	16.6	+43.5	77.7	13	29.2	+44.2	78.0	13	41.6	+44.9	78.2	13	53.7	+45.7	78.4	18
19	13	18.6	+41.1	76.3	13	32.6	+42.0	76.5	13	46.5	+42.6	76.8	14	00.1	+43.4	77.0	14	13.4	+44.1	77.3	14	26.5	+44.8	77.5	14	39.4	+45.5	77.8	19
20	13	59.7	+41.0	75.6	14	14.6	+41.2	76.1	14	43.5	+43.2	76.3	14	57.5	+44.0	76.6	15	11.3	+44.7	76.8	15	24.9	+45.4	77.1	15	38.1	+46.1	77.4	20
21	14	40.7	+40.9	74.8	14	56.3	+41.7	75.1	15	11.7	+42.3	75.3	15	26.7	+43.1	75.6	15	41.5	+43.9	75.9	15	56.0	+44.6	76.1	16	10.3	+45.2	76.4	21
22	15	21.6	+40.7	74.1	15	38.0	+41.4	74.3	15	54.0	+42.3	74.6	16	09.8	+43.0	74.9	16	25.4	+43.7	75.2	16	40.6	+44.4	75.4	16	55.5	+45.1	75.7	22
23	16	02.3	+40.6	73.3	16	19.4	+41.4	73.6	16	36.3	+42.0	73.9	16	52.8	+42.8	74.1	17	09.1	+43.5	74.4	17	25.0	+44.3	74.7	17	40.6	+45.0	75.0	23
24	16	42.9	+40.4	72.5	17	00.8	+41.1	72.8	17	21.8	+43.1	73.1	17	35.6	+42.7	73.4	17	52.6	+43.4	73.7	18	09.3	+44.1	74.0	18	25.6	+44.8	74.3	24
25	17	23.3	+40.2	71.8	17	41.9	+41.0	72.1	18	00.2	+41.8	72.4	18	18.3	+42.4	72.7	18	36.0	+43.2	73.0	18	53.4	+43.9	73.3	19	10.4	+44.7	73.6	25
26	18	03.5	+40.0	71.0	18	22.9	+40.8	71.3	18	42.0	+41.5	71.6	19	00.7	+42.3	71.9	19	19.2	+43.0	72.3	19	37.3	+43.8	72.6	19	55.1	+44.5	72.9	26
27	18	43.5	+39.8	70.2	19	03.7	+40.5	70.5	19	23.5	+41.4	70.8	19	43.0	+42.1	71.2	20	02.2	+42.9	71.5	20	21.1	+43.6	71.9	20	39.6	+44.3	72.2	27
28	19	23.3	+39.6	69.4	19	44.2	+40.4	69.7	20	04.9	+41.1	70.1	20	25.1	+42.0	70.4	20	45.1	+42.6	70.8	21	04.7	+43.4	71.1	21	23.9	+44.1	71.5	28
29	20	0.9	+39.4	68.6	20	24.6	+40.2	68.9	20	46.0	+41.0	69.3	21	07.1	+41.7	69.6	21	27.7	+42.5	70.0	21	48.1	+43.2	70.4	22	08.0	+43.9	70.8	29
30	20	42.3	+39.2	67.8	21	04.8	+39.9	68.1	21	27.0	+40.7	68.5	21	48.8	+41.4	68.9	22	10.2	+42.2	69.3	22	31.3	+42.9	69.6	22	51.9	+43.8	70.0	30
31	21	21.5	+38.9	67.0	21	44.7	+39.8	67.3	22	07.7	+40.5	67.7	22	30.2	+41.3	68.1	22	52.4	+42.0	68.5	23	35.7	+43.5	68.9	23	56.7	+44.2	69.7	31
32	22	00.4	+38.7	66.2	22	25.4	+39.5	66.5	22	48.2	+40.2	66.9	23	11.5	+41.0	67.3	23	34.4	+41.8	67.7	24	19.2	+42.3	68.1	24	40.9	+44.0	69.0	32
33	22	39.1	+38.4	65.3	23	03.9	+38.2	65.7	23	28.4	+39.0	66.1	23	52.5	+40.8	66.5	24	16.2	+41.6	66.9	24	39.5	+42.3	67.3	25	52.4	+43.1	67.7	33
34	23	17.5	+38.1	64.5	23	31.8	+38.0	64.8	23	55.1	+38.7	65.2	24	13.5	+40.4	65.6	24	39.0	+41.1	65.9	25	52.4	+42.9	66.3	25	65.4	+43.7	66.7	34
35	23	55.6	+37.9	63.7	24	22.1	+38.7	64.1	24	48.1	+39.5	64.5	25	13.8	+40.2	64.9	25	39.0	+41.1	65.3	26	03.9	+41.8	65.8	26	28.3	+42.5	66.2	35
36	24	33.5	+37.6	62.8	25	27.6	+39.2	63.6	25	54.0	+40.0	64.1	26	20.1	+40.7	64.5	26	45.7	+41.5	65.0	27	10.8	+42.3	65.4	27	35.6	+43.0	65.9	36
37	25	11.1	+37.3	61.9	25	39.1	+38.1	62.4	26	0.8	+																		